

COMPUTER NETWORKS

“LAB MANUAL”

SUBMITTED TO:
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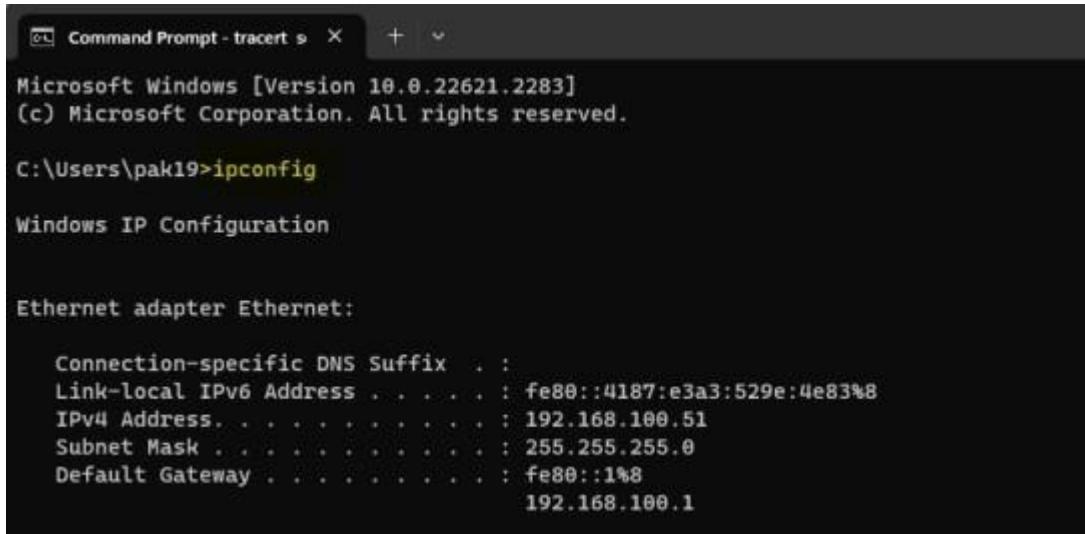
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LAB#01

Hands on Practice of Basic Commands on Desktop

Verify the connectivity of the workstation to the internet. Type ip configuration (short for IP configuration) and press Enter the screen will show the IP address, subnet mask, and default gateway for your computer's connection.



```
Command Prompt - tracert s + ~

Microsoft Windows [Version 10.0.22621.2283]
(c) Microsoft Corporation. All rights reserved.

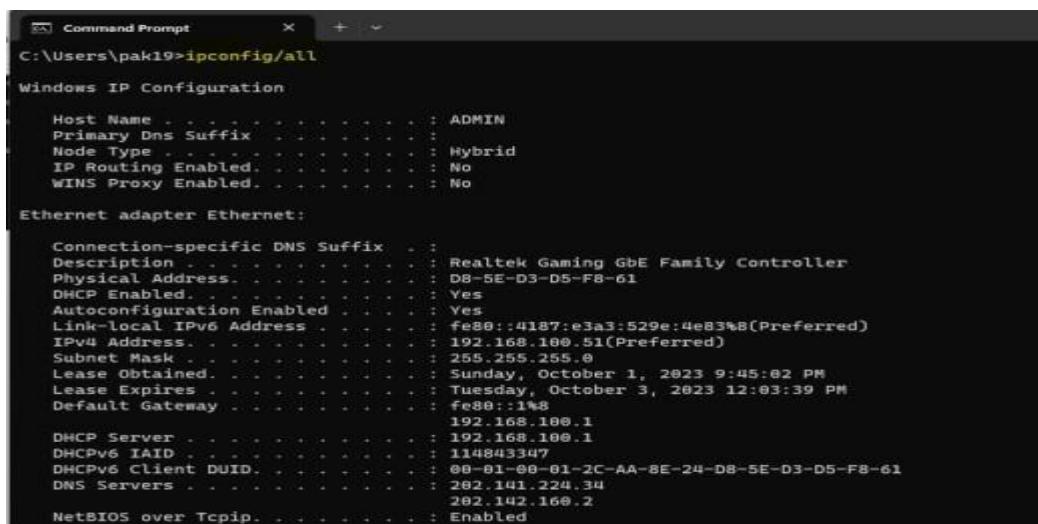
C:\Users\pak19>ipconfig

Windows IP Configuration

Ethernet adapter Ethernet:

  Connection-specific DNS Suffix . :
  Link-local IPv6 Address . . . . . : fe80::4187:e3a3:529e:4e83%8
  IPv4 Address . . . . . : 192.168.100.51
  Subnet Mask . . . . . : 255.255.255.0
  Default Gateway . . . . . : fe80::1%8
                                192.168.100.1
```

Check more detailed TCP/IP configuration information. Type ip configuration /all and press enter.



```
Command Prompt x + ~

C:\Users\pak19>ipconfig/all

Windows IP Configuration

  Host Name . . . . . : ADMIN
  Primary Dns Suffix . . . . . :
  Node Type . . . . . : Hybrid
  IP Routing Enabled. . . . . : No
  WINS Proxy Enabled. . . . . : No

Ethernet adapter Ethernet:

  Connection-specific DNS Suffix . . . . . :
  Description . . . . . : Realtek Gaming GbE Family Controller
  Physical Address . . . . . : DB-5E-D3-D5-F8-61
  DHCP Enabled. . . . . : Yes
  Autoconfiguration Enabled . . . . . : Yes
  Link-local IPv6 Address . . . . . : fe80::4187:e3a3:529e:4e83%8(Preferred)
  IPv4 Address . . . . . : 192.168.100.51(Preferred)
  Subnet Mask . . . . . : 255.255.255.0
  Lease Obtained. . . . . : Sunday, October 1, 2023 9:45:02 PM
  Lease Expires . . . . . : Tuesday, October 3, 2023 12:03:39 PM
  Default Gateway . . . . . : fe80::1%8
                                192.168.100.1
  DHCP Server . . . . . : 192.168.100.1
  DHCPv6 IAID . . . . . : 114843347
  DHCPv6 Client DUID. . . . . : 00-01-00-01-2C-AA-8E-24-DB-5E-D3-D5-F8-61
  DNS Servers . . . . . : 202.141.224.34
                                202.142.160.2
  NetBIOS over Tcpip. . . . . : Enabled
```

Ping with another device's IP Address

```
C:\Users\pak19>ping 192.168.100.75

Pinging 192.168.100.75 with 32 bytes of data:
Reply from 192.168.100.75: bytes=32 time=46ms TTL=64
Reply from 192.168.100.75: bytes=32 time=75ms TTL=64
Reply from 192.168.100.75: bytes=32 time=3ms TTL=64
Reply from 192.168.100.75: bytes=32 time=2ms TTL=64

Ping statistics for 192.168.100.75:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 2ms, Maximum = 75ms, Average = 31ms
```

Ping the ip address of the device currently using

```
C:\Users\pak19>ping 192.168.100.1

Pinging 192.168.100.1 with 32 bytes of data:
Reply from 192.168.100.1: bytes=32 time<1ms TTL=64

Ping statistics for 192.168.100.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

LOOP BACK TESTING

```
C:\Users\pak19>ping 127.0.0.1

Pinging 127.0.0.1 with 32 bytes of data:
Reply from 127.0.0.1: bytes=32 time<1ms TTL=128

Ping statistics for 127.0.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Ping with a web address (www.fjwu.edu.pk)

```
C:\Users\pak19>ping www.fjwu.edu.pk

Pinging www.fjwu.edu.pk [104.21.52.190] with 32 bytes of data:
Reply from 104.21.52.190: bytes=32 time=102ms TTL=55
Reply from 104.21.52.190: bytes=32 time=100ms TTL=55
Reply from 104.21.52.190: bytes=32 time=100ms TTL=55
Reply from 104.21.52.190: bytes=32 time=100ms TTL=55

Ping statistics for 104.21.52.190:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 100ms, Maximum = 102ms, Average = 100ms
```

Trace the route to the website of the Department of Software Engineering.

```
C:\Users\pak19>tracert www.fjwu.edu.pk

Tracing route to www.fjwu.edu.pk [104.21.52.190]
over a maximum of 30 hops:

 1  <1 ms    <1 ms    <1 ms  192.168.100.1
 2  3 ms     3 ms     3 ms  125-209-100-1.multi.net.pk [125.209.100.1]
 3  17 ms    14 ms    12 ms  202-142-160-249.multi.net.pk [202.142.160.249]
 4  22 ms    22 ms    22 ms  203.135.29.149
 5  *         21 ms    *      10.253.12.20
 6  22 ms    23 ms    22 ms  10.253.4.18
 7  *         *         *      Request timed out.
 8  *         *         100 ms port-channel1.core3.sin1.he.net [184.105.223.134]
 9  101 ms   100 ms   101 ms  cloudflare2.sgx.sg [103.16.102.229]
10  100 ms   101 ms   101 ms  172.70.144.5
11  102 ms   100 ms   100 ms  104.21.52.190

Trace complete.
```

Trace the route to the website of Fatima Jinnah Women University.

```
C:\Users\pak19>tracert se.fjwu.edu.pk

Tracing route to se.fjwu.edu.pk [172.67.202.222]
over a maximum of 30 hops:

 1  <1 ms    <1 ms    <1 ms  192.168.100.1
 2  7 ms     12 ms    3 ms  125-209-100-1.multi.net.pk [125.209.100.1]
 3  4 ms     9 ms     10 ms  202-142-160-249.multi.net.pk [202.142.160.249]
 4  23 ms    22 ms    22 ms  203.135.29.149
 5  22 ms    22 ms    22 ms  10.253.12.20
 6  22 ms    22 ms    22 ms  10.253.4.18
 7  *         *         *      Request timed out.
 8  *         *         *      Request timed out.
 9  *         *         100 ms cloudflare.sgx.sg [103.16.102.93]
10  101 ms   100 ms   100 ms  162.158.168.2
11  100 ms   101 ms   100 ms  172.67.202.222

Trace complete.
```

LAB#02

Intro to Packet Tracer

TASK#01

What is Difference between Straight Through & Cross-over cables?

1. STRAIGHT-THROUGH ETHERNET CABLE

- An Ethernet straight-through cable is used to connect two different devices.
- For instance, if you need to connect your laptop to a router or switch, you will need a straight through cable. The cable follows the same wiring standard on both of its ends.
- If one end of the cable is terminated according to T568 A standard, the other end also must be terminated according to the same pattern.

2. CROSS-OVER ETHERNET CABLE

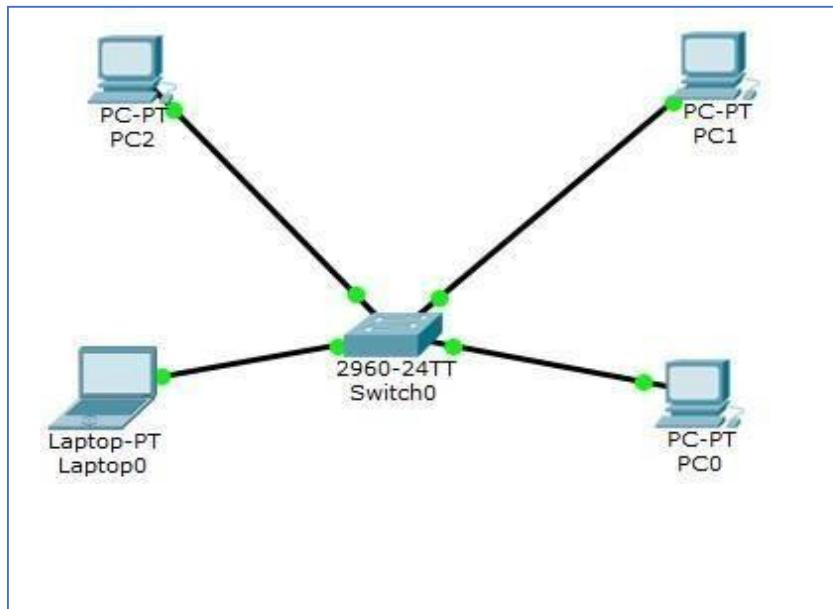
- An ethernet crossover cable is used to connect the same or similar devices in a network.
- For example, if you need to connect two computers or other similar electronic devices, you will need a crossover cable.
- It reverses the direction of signal transmission which is necessary to exchange data between different devices. Essentially, this type of cable is a patch cable that connects different devices in a network and it is mostly used as an alternative to wireless connections.

TASK#02

Understanding and Implementing basic LAN environment on Cisco Packet Tracer.

TOPOLOGIES USING 'SWITCH'

1. STAR TOPOLOGY



Command Prompt

```
Packet Tracer PC Command Line 1.0
PC>ping 1.1.1.1

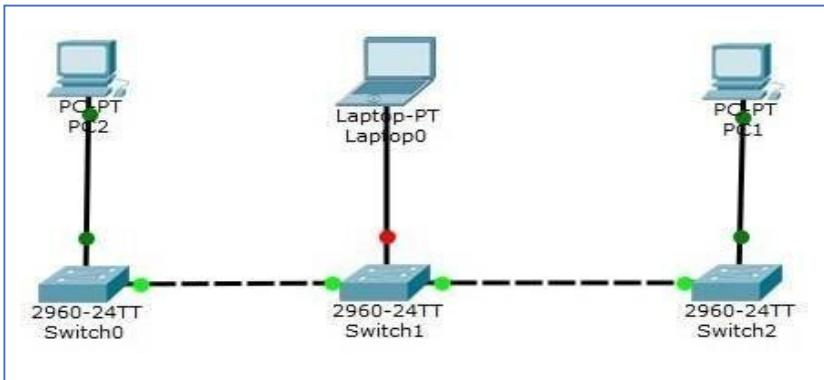
Pinging 1.1.1.1 with 32 bytes of data:

Reply from 1.1.1.1: bytes=32 time=7ms TTL=128
Reply from 1.1.1.1: bytes=32 time=22ms TTL=128
Reply from 1.1.1.1: bytes=32 time=0ms TTL=128
Reply from 1.1.1.1: bytes=32 time=30ms TTL=128

Ping statistics for 1.1.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 30ms, Average = 14ms

PC>|
```

2. BUS TOPOLOGY



Command Prompt

```
Packet Tracer PC Command Line 1.0
PC>ping 1.1.1.4

Pinging 1.1.1.4 with 32 bytes of data:

Reply from 1.1.1.4: bytes=32 time=7ms TTL=128
Reply from 1.1.1.4: bytes=32 time=23ms TTL=128
Reply from 1.1.1.4: bytes=32 time=36ms TTL=128
Reply from 1.1.1.4: bytes=32 time=21ms TTL=128

Ping statistics for 1.1.1.4:
  Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
  Approximate round trip times in milli-seconds:
    Minimum = 7ms, Maximum = 36ms, Average = 21ms

PC>
```

Command Prompt

```
Packet Tracer PC Command Line 1.0
PC>ping 1.1.1.3

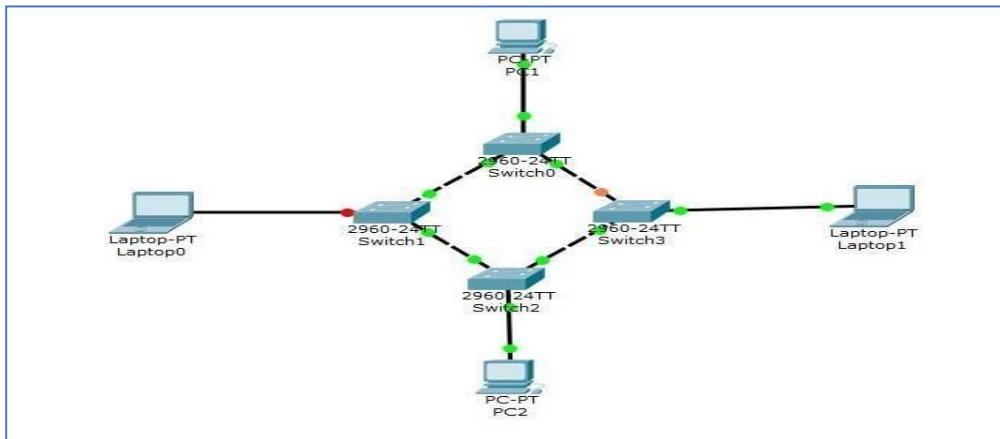
Pinging 1.1.1.3 with 32 bytes of data:

Reply from 1.1.1.3: bytes=32 time=6ms TTL=128
Reply from 1.1.1.3: bytes=32 time=1ms TTL=128
Reply from 1.1.1.3: bytes=32 time=22ms TTL=128
Reply from 1.1.1.3: bytes=32 time=11ms TTL=128

Ping statistics for 1.1.1.3:
  Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
  Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 22ms, Average = 10ms

PC>
```

3. RING TOPOLOGY



Command Prompt

```
Packet Tracer PC Command Line 1.0
PC>ping 1.1.1.5

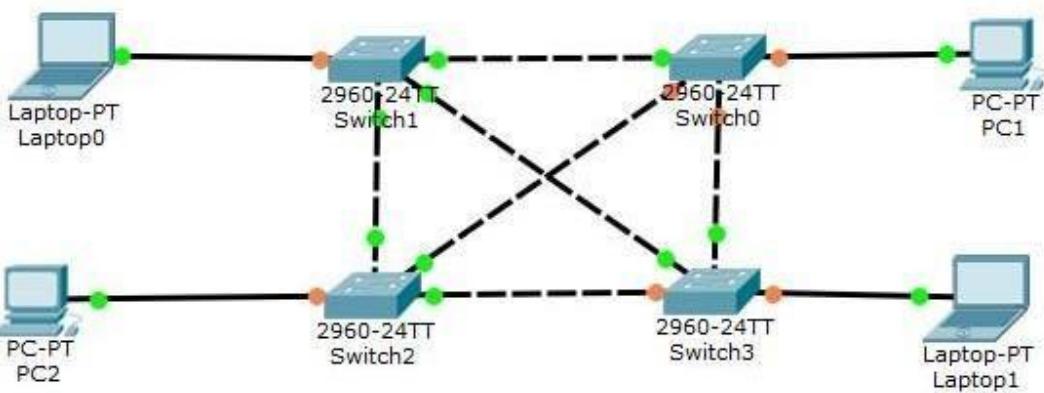
Pinging 1.1.1.5 with 32 bytes of data:

Reply from 1.1.1.5: bytes=32 time=0ms TTL=128
Reply from 1.1.1.5: bytes=32 time=28ms TTL=128
Reply from 1.1.1.5: bytes=32 time=39ms TTL=128
Reply from 1.1.1.5: bytes=32 time=29ms TTL=128

Ping statistics for 1.1.1.5:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 39ms, Average = 24ms

PC>
```

4. MESH TOPOLOGY



```

PC>ping 1.1.1.1

Pinging 1.1.1.1 with 32 bytes of data:

Reply from 1.1.1.1: bytes=32 time=0ms TTL=128
Reply from 1.1.1.1: bytes=32 time=0ms TTL=128
Reply from 1.1.1.1: bytes=32 time=0ms TTL=128
Reply from 1.1.1.1: bytes=32 time=3ms TTL=128

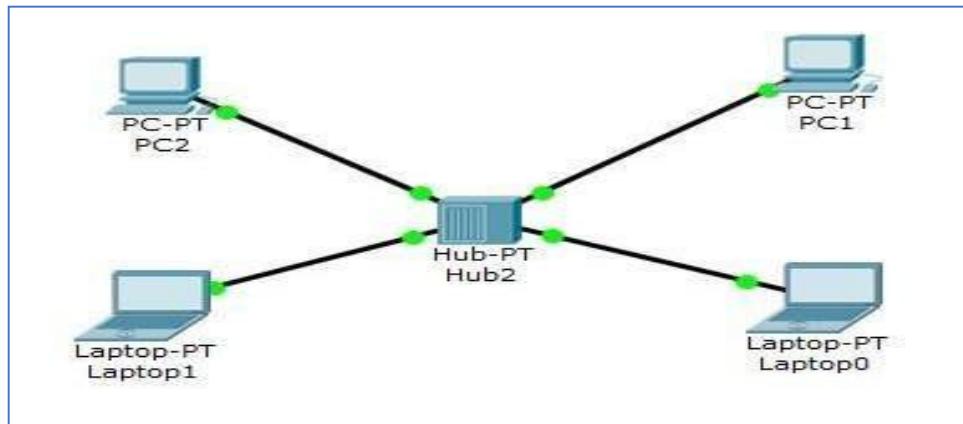
Ping statistics for 1.1.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 3ms, Average = 0ms

PC>

```

TOPOLOGIES USING ‘HUB’

1. STAR TOPOLOGY



```

PC>ping 1.1.1.1

Pinging 1.1.1.1 with 32 bytes of data:

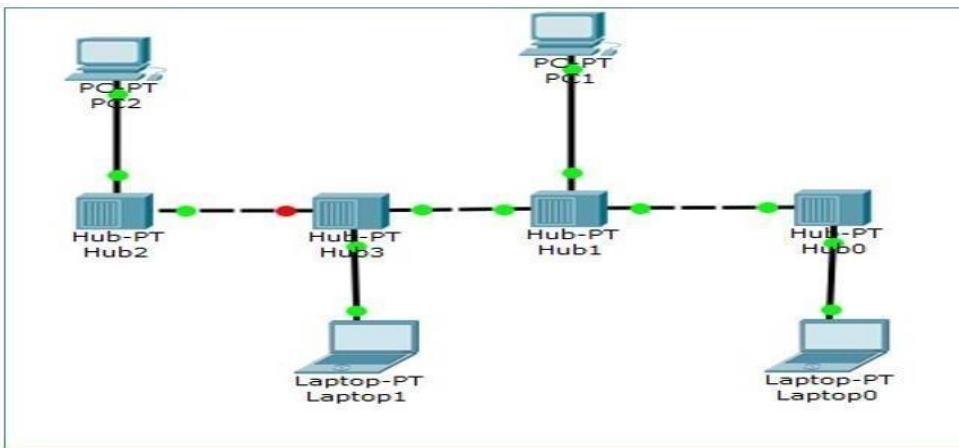
Reply from 1.1.1.1: bytes=32 time=0ms TTL=128
Reply from 1.1.1.1: bytes=32 time=0ms TTL=128
Reply from 1.1.1.1: bytes=32 time=0ms TTL=128
Reply from 1.1.1.1: bytes=32 time=3ms TTL=128

Ping statistics for 1.1.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 3ms, Average = 0ms

PC>

```

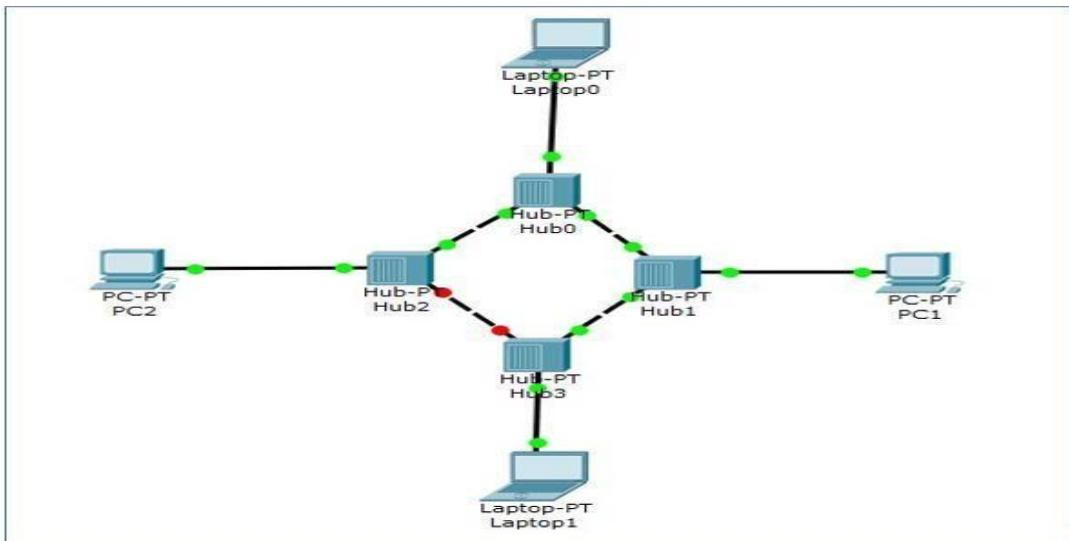
2. BUS TOPOLOGY



```
PC>ping 1.1.1.5
Pinging 1.1.1.5 with 32 bytes of data:
Reply from 1.1.1.5: bytes=32 time=0ms TTL=128
Reply from 1.1.1.5: bytes=32 time=1ms TTL=128
Reply from 1.1.1.5: bytes=32 time=1ms TTL=128
Reply from 1.1.1.5: bytes=32 time=1ms TTL=128

Ping statistics for 1.1.1.5:
  Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
PC>
```

3. RING TOPOLOGY



```
PC>PING 1.1.1.5

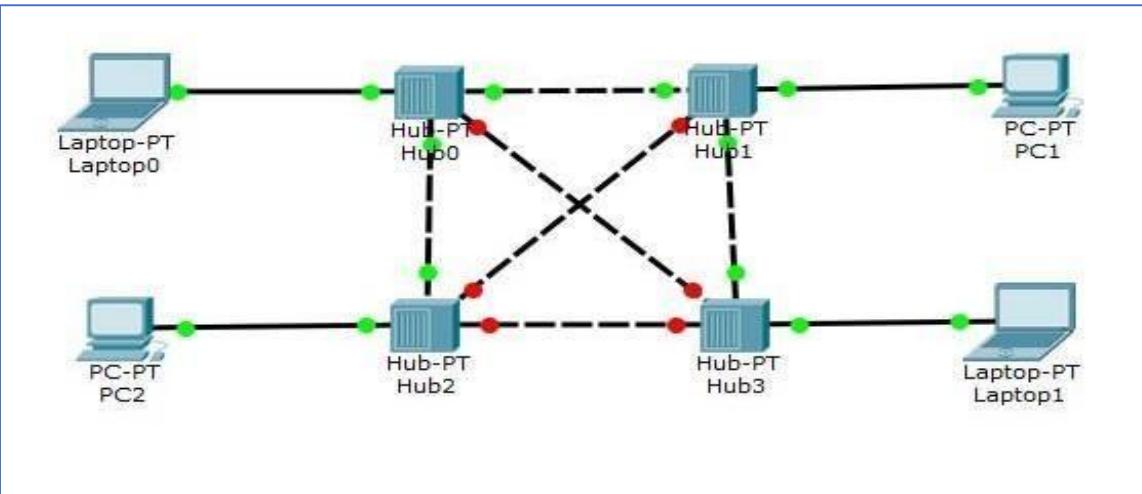
Pinging 1.1.1.5 with 32 bytes of data:

Reply from 1.1.1.5: bytes=32 time=0ms TTL=128
Reply from 1.1.1.5: bytes=32 time=1ms TTL=128
Reply from 1.1.1.5: bytes=32 time=0ms TTL=128
Reply from 1.1.1.5: bytes=32 time=3ms TTL=128

Ping statistics for 1.1.1.5:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 3ms, Average = 1ms
```

PC>

4. MESH TOPOLOGY



```
PC>PING 1.1.1.5

Pinging 1.1.1.5 with 32 bytes of data:

Reply from 1.1.1.5: bytes=32 time=0ms TTL=128
Reply from 1.1.1.5: bytes=32 time=1ms TTL=128
Reply from 1.1.1.5: bytes=32 time=0ms TTL=128
Reply from 1.1.1.5: bytes=32 time=3ms TTL=128

Ping statistics for 1.1.1.5:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 3ms, Average = 1ms
```

PC>

LAB#03

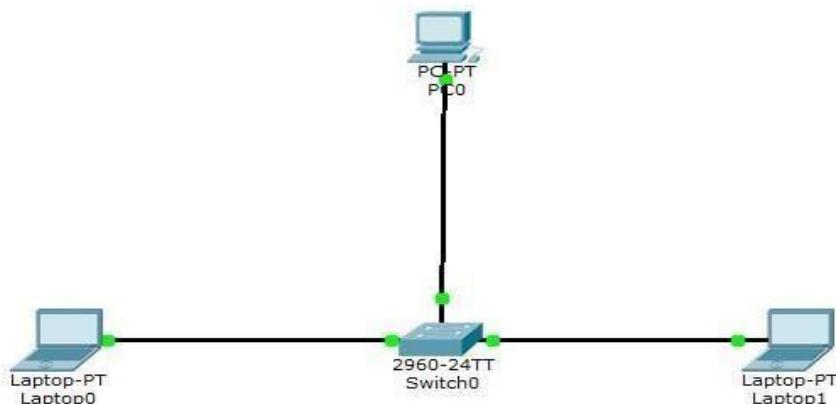
IP Addressing/Schemes & Classes of IP Addresses Switch Port Security

STAR TOPOLOGY

CLASS A

LAPTOP 0: 120.1.1.1

PC0: 120.2.1.3



Realtime											
Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete	
●	Successful	Laptop0	PC0	ICMP	Light Blue	0.000	N	0	(edit)	(delete)	
●	Successful	PC0	Laptop1	ICMP	Blue	0.000	N	1	(edit)	(delete)	
●	Successful	Laptop1	Laptop0	ICMP	Dark Blue	0.000	N	2	(edit)	(delete)	

Command Prompt

```
Packet Tracer PC Command Line 1.0
PC>PING 120.1.1.1

Pinging 120.1.1.1 with 32 bytes of data:

Reply from 120.1.1.1: bytes=32 time=5ms TTL=128
Reply from 120.1.1.1: bytes=32 time=4ms TTL=128
Reply from 120.1.1.1: bytes=32 time=0ms TTL=128
Reply from 120.1.1.1: bytes=32 time=4ms TTL=128

Ping statistics for 120.1.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 5ms, Average = 3ms
```

Command Prompt

```
PC>PING 120.2.1.3

Pinging 120.2.1.3 with 32 bytes of data:

Reply from 120.2.1.3: bytes=32 time=0ms TTL=128
Reply from 120.2.1.3: bytes=32 time=0ms TTL=128
Reply from 120.2.1.3: bytes=32 time=1ms TTL=128
Reply from 120.2.1.3: bytes=32 time=6ms TTL=128

Ping statistics for 120.2.1.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 6ms, Average = 1ms
```

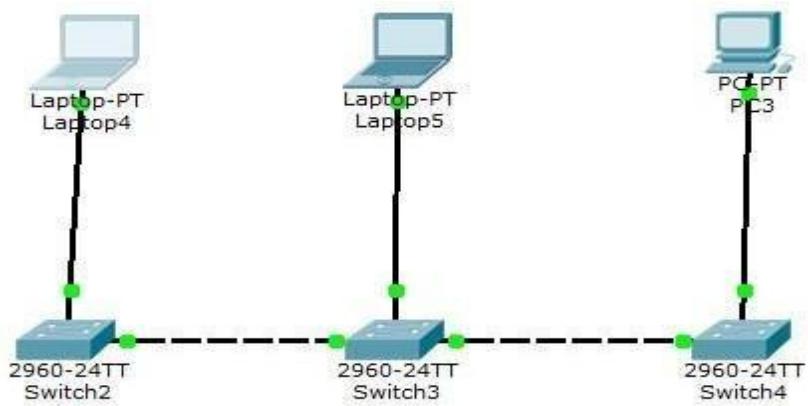
```
PC>PING 120.3.2.1
```

```
Pinging 120.3.2.1 with 32 bytes of data:

Reply from 120.3.2.1: bytes=32 time=1ms TTL=128
Reply from 120.3.2.1: bytes=32 time=0ms TTL=128
Reply from 120.3.2.1: bytes=32 time=0ms TTL=128
Reply from 120.3.2.1: bytes=32 time=0ms TTL=128

Ping statistics for 120.3.2.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

BUS TOPOLOGY



Realtime										
Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete
●	Successful	Laptop0	PC0	ICMP	blue	0.000	N	0	(edit)	(delete)
●	Successful	PC0	Laptop1	ICMP	red	0.000	N	1	(edit)	(delete)
●	Successful	Laptop1	Laptop0	ICMP	dark blue	0.000	N	2	(edit)	(delete)

```
PC>PING 191.190.4.2

Pinging 191.190.4.2 with 32 bytes of data:

Reply from 191.190.4.2: bytes=32 time=7ms TTL=128
Reply from 191.190.4.2: bytes=32 time=0ms TTL=128
Reply from 191.190.4.2: bytes=32 time=4ms TTL=128
Reply from 191.190.4.2: bytes=32 time=4ms TTL=128

Ping statistics for 191.190.4.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 7ms, Average = 3ms

PC>
```

```

PC>PING 191.190.6.4

Pinging 191.190.6.4 with 32 bytes of data:

Reply from 191.190.6.4: bytes=32 time=0ms TTL=128

Ping statistics for 191.190.6.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

```

```

PC>PING 191.190.1.0

Pinging 191.190.1.0 with 32 bytes of data:

Reply from 191.190.1.0: bytes=32 time=0ms TTL=128

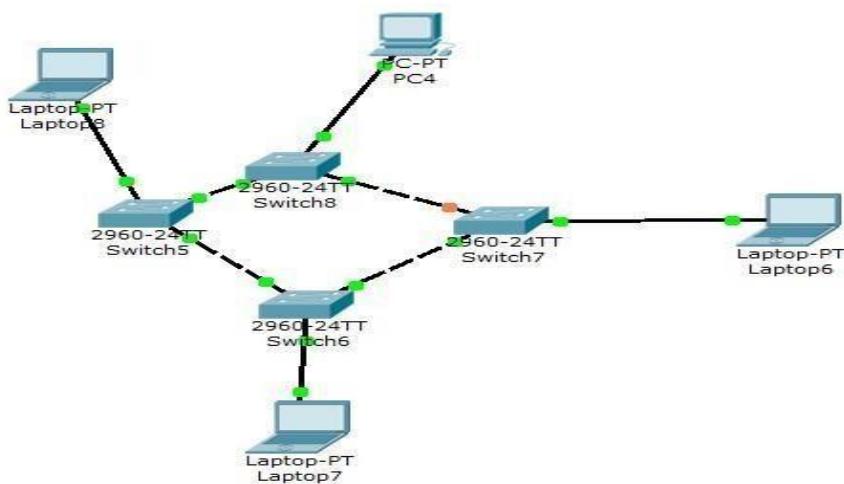
Ping statistics for 191.190.1.0:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

```

PC>

RING TOPOLOGY

CLASS C



Realtime											
Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete	
●	Successful	Laptop8	PC4	ICMP	Green	0.000	N	0	(edit) (delete)		
●	Successful	Laptop6	Laptop7	ICMP	Magenta	0.000	N	1	(edit) (delete)		
●	Successful	Laptop7	Laptop8	ICMP	Blue	0.000	N	2	(edit) (delete)		

```
Packet Tracer PC Command Line 1.0
PC>ping 221.222.223.1

Pinging 221.222.223.1 with 32 bytes of data:

Reply from 221.222.223.1: bytes=32 time=4ms TTL=128
Reply from 221.222.223.1: bytes=32 time=3ms TTL=128
Reply from 221.222.223.1: bytes=32 time=0ms TTL=128
Reply from 221.222.223.1: bytes=32 time=3ms TTL=128

Ping statistics for 221.222.223.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 4ms, Average = 2ms
```

```
PC>ping 221.222.223.2

Pinging 221.222.223.2 with 32 bytes of data:

Reply from 221.222.223.2: bytes=32 time=0ms TTL=128
Reply from 221.222.223.2: bytes=32 time=1ms TTL=128
Reply from 221.222.223.2: bytes=32 time=0ms TTL=128
Reply from 221.222.223.2: bytes=32 time=2ms TTL=128

Ping statistics for 221.222.223.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 2ms, Average = 0ms
```

CLASS C FAILED COMMUNICATION

Laptop0

IP Configuration

IP Configuration

DHCP Static

IP Address: 221.222.223.0

Subnet Mask: 255.0.0.0

PC0

IP Configuration

IP Configuration

DHCP Static

IP Address: 221.222.222.191

Subnet Mask: 255.0.0.0

Laptop1

IP Configuration

IP Configuration

DHCP Static

IP Address: 222.222.222.255

Subnet Mask: 255.0.0.0

Realtime											
Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete	
●	Successful	Laptop0	PC0	ICMP	■	0.000	N	0	(edit)	(delete)	■
●	Successful	PC0	Laptop0	ICMP	■	0.000	N	1	(edit)	(delete)	■

```
PC>ping 222.222.222.255
Pinging 222.222.222.255 with 32 bytes of data:
Request timed out.
```

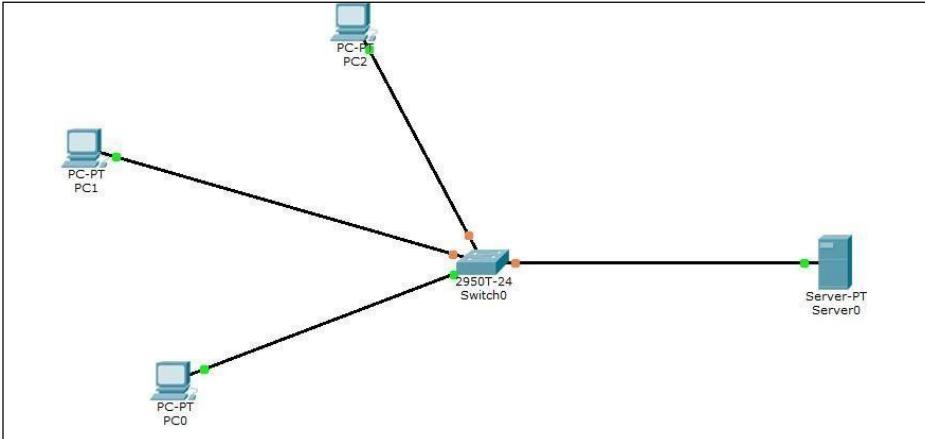
CLASS A FAILED COMMUNICATION

Realtime											
Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete	
●	Failed	PC0	Laptop1	ICMP	■	0.000	N	0	(edit)	(delete)	■
●	Failed	Laptop1	Laptop0	ICMP	■	0.000	N	1	(edit)	(delete)	■
●	Failed	PC0	Laptop0	ICMP	■	0.000	N	2	(edit)	(delete)	■

LAB#04

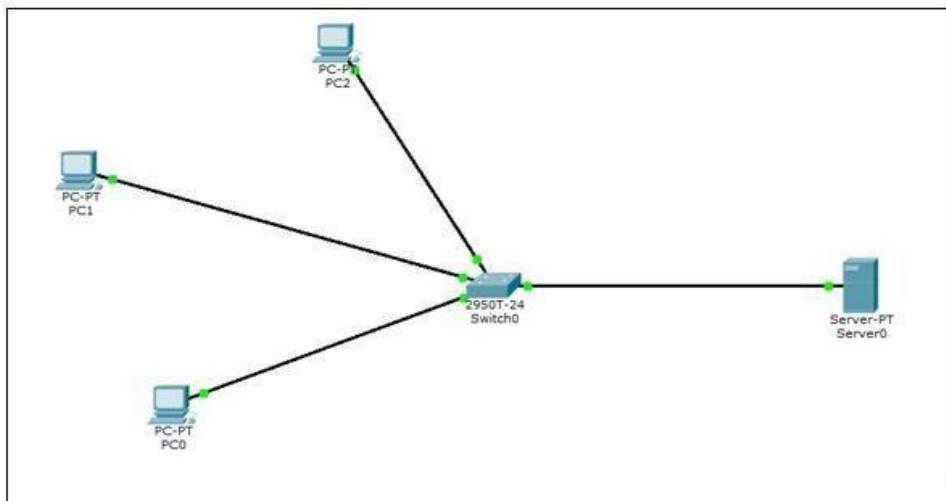
SERVER SERVICES

Set up a simple network.



Assign IP addresses. (Network part:23)

- **Server: 23.1.1.1**
- **PC-0: 23.1.1.2**
- **PC-1: 23.1.1.3**
- **PC-2: 23.1.1.4**



Ping the IP addresses.

```

Command Prompt

Packet Tracer SERVER Command Line 1.0
SERVER>ping 23.1.1.1

Pinging 23.1.1.1 with 32 bytes of data:

Reply from 23.1.1.1: bytes=32 time=3ms TTL=128
Reply from 23.1.1.1: bytes=32 time=12ms TTL=128
Reply from 23.1.1.1: bytes=32 time=12ms TTL=128
Reply from 23.1.1.1: bytes=32 time=11ms TTL=128

Ping statistics for 23.1.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 3ms, Maximum = 12ms, Average = 9ms

SERVER>

PC>ping 23.1.1.2

Pinging 23.1.1.2 with 32 bytes of data:

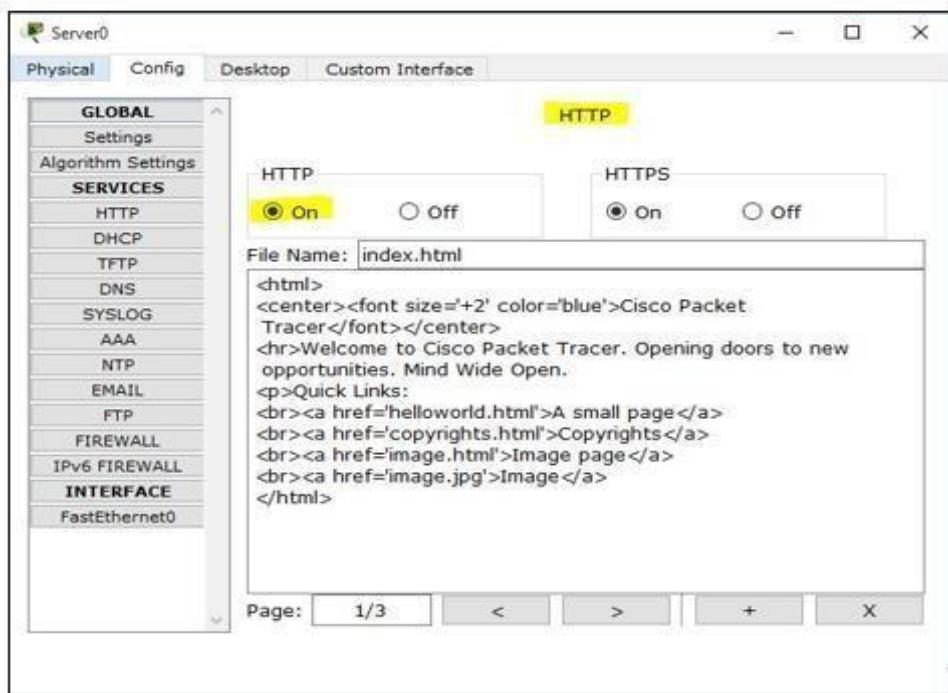
Reply from 23.1.1.2: bytes=32 time=4ms TTL=128
Reply from 23.1.1.2: bytes=32 time=17ms TTL=128
Reply from 23.1.1.2: bytes=32 time=12ms TTL=128
Reply from 23.1.1.2: bytes=32 time=11ms TTL=128

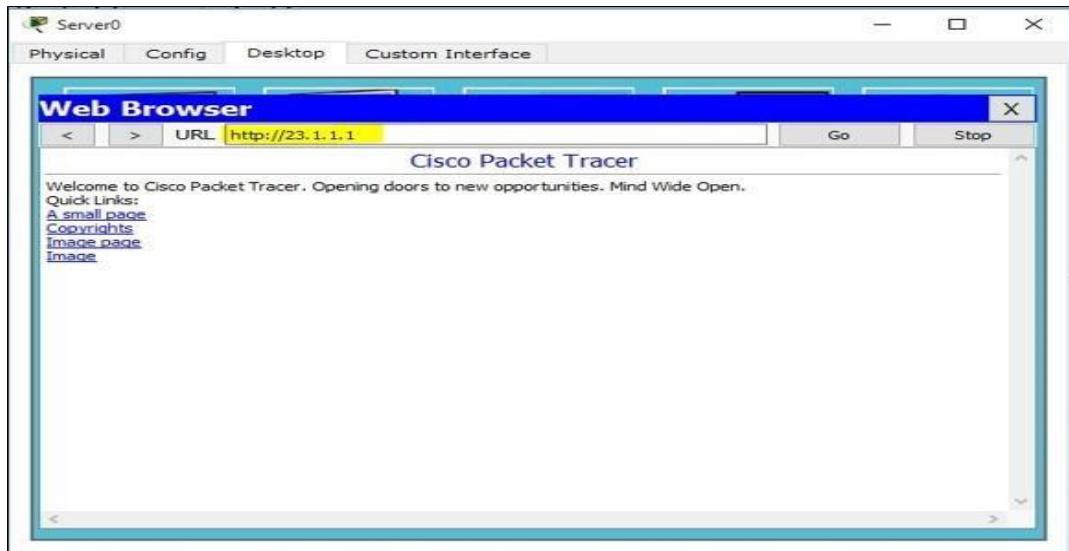
Ping statistics for 23.1.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 4ms, Maximum = 17ms, Average = 11ms

PC>

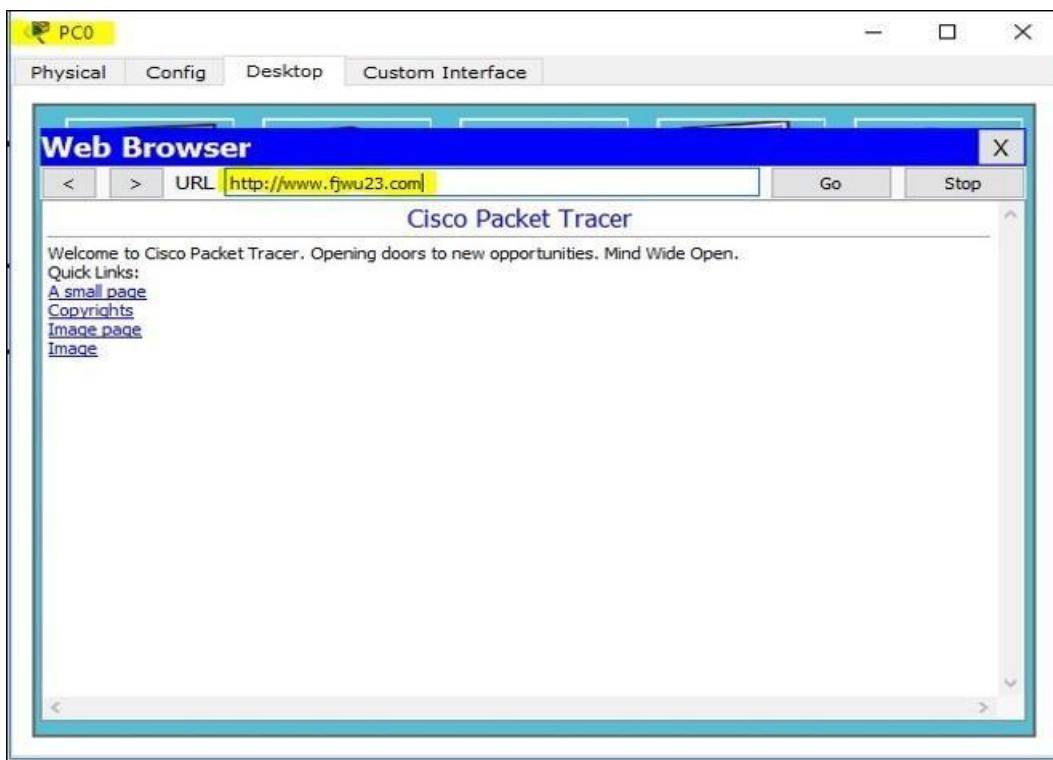
```

Select HTTP services and make sure the service is on by clicking on ON option.

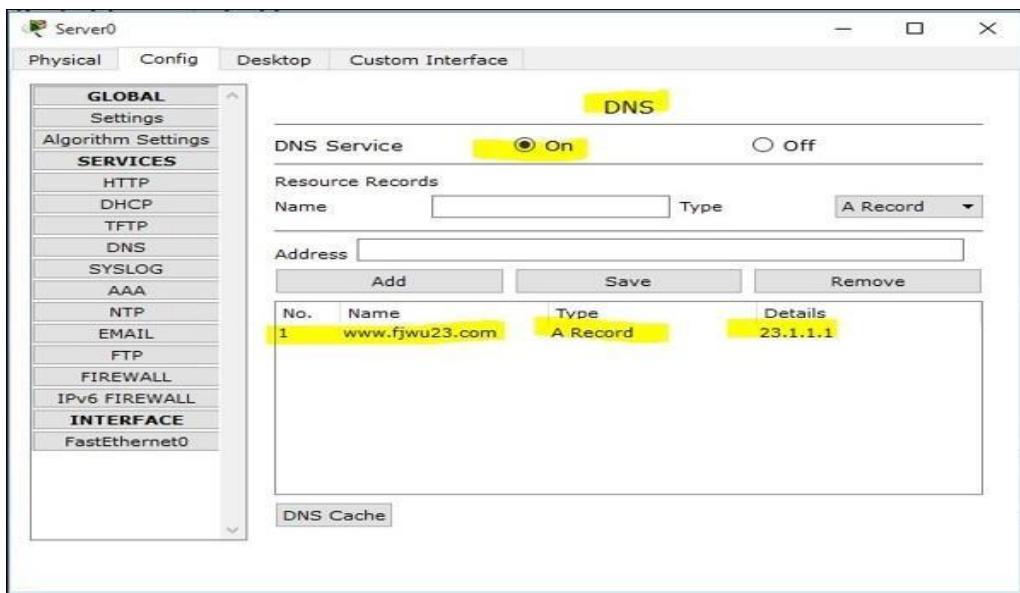




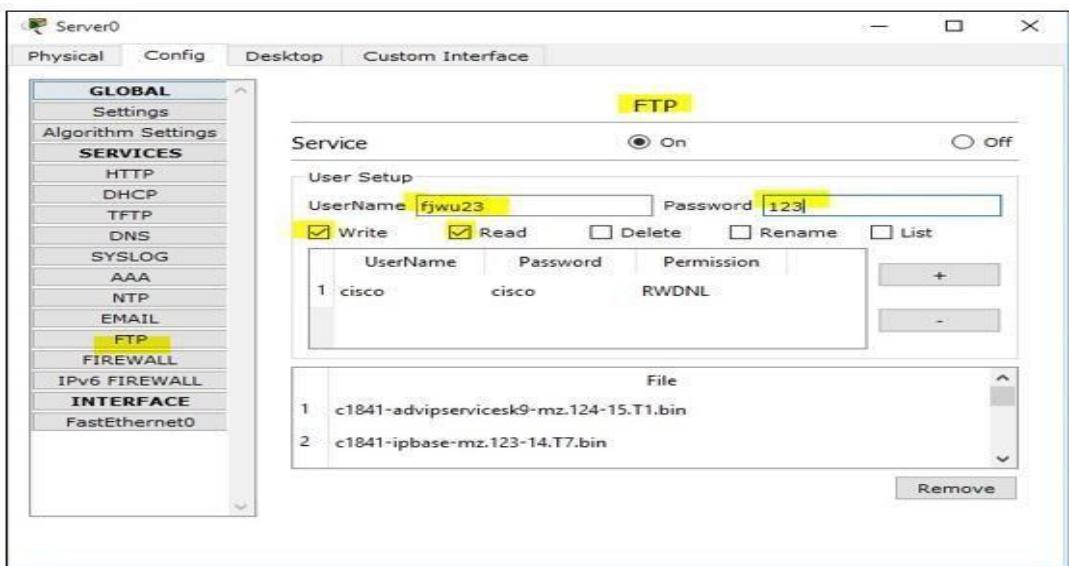
DNS can be used to run the web browser at the node end.



Turn on the DNS service on server side.



Turn on FTP services on server side.

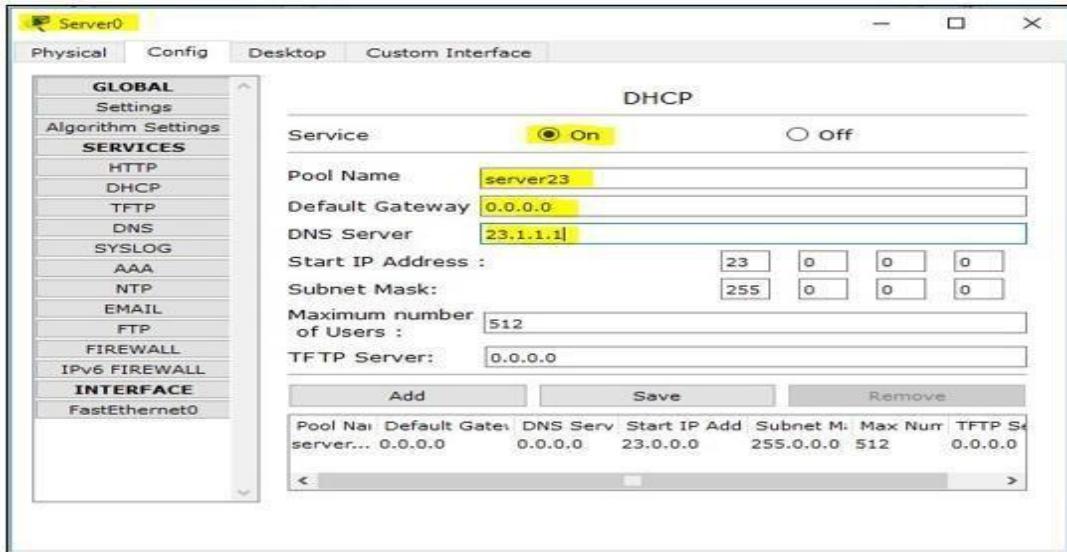


Check ftp services through end

```
PC>ftp 23.1.1.1
Trying to connect...23.1.1.1
Connected to 23.1.1.1
220- Welcome to PT Ftp server
Username:fjwu23
331- Username ok, need password
Password:
230- Logged in
(passive mode On)
ftp>
```

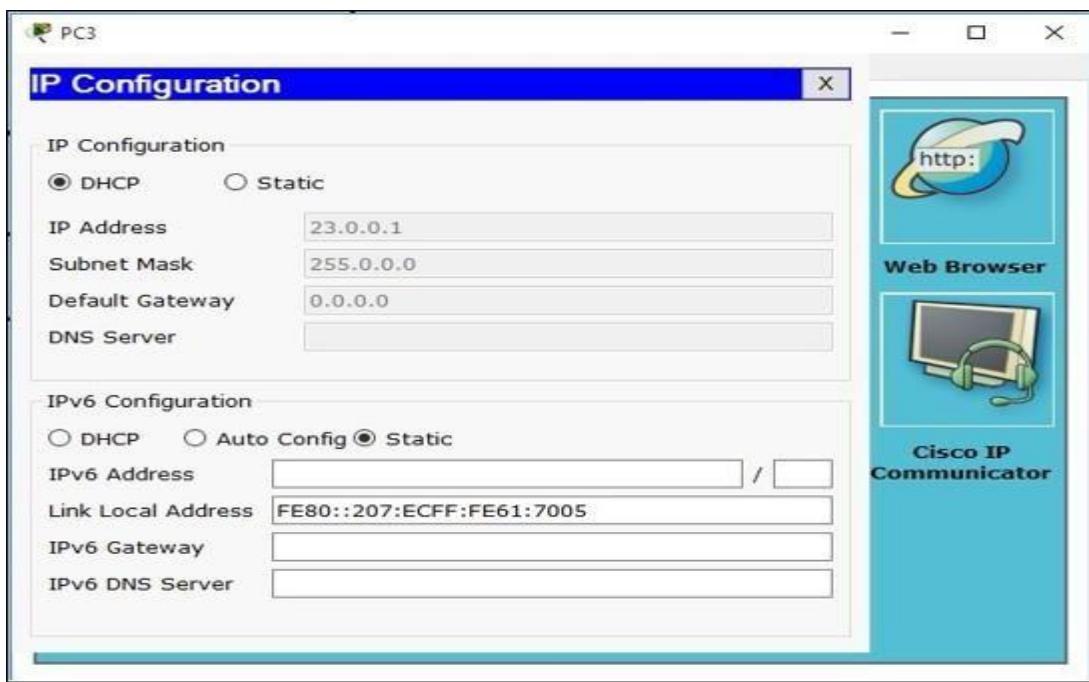
Add another pc in network and give it IP address through DHCP. First, turn ON the DHCP service at server end.

SERVER END



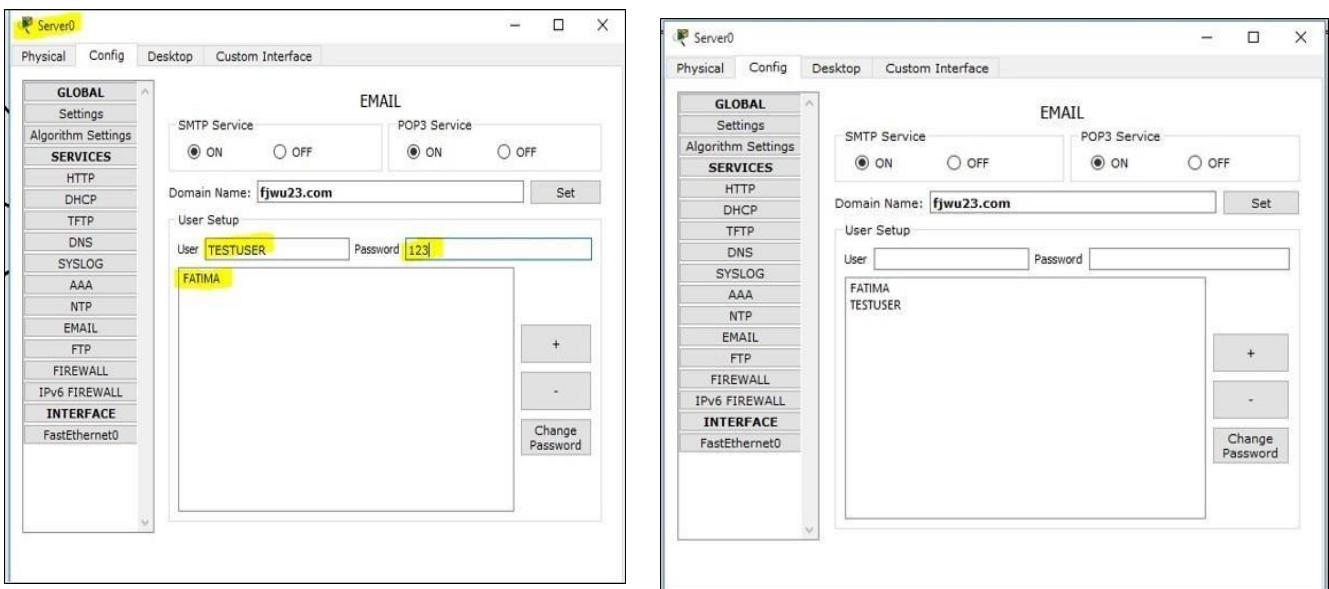
NODE END

Now, node can be assigned IP address through DHCP.

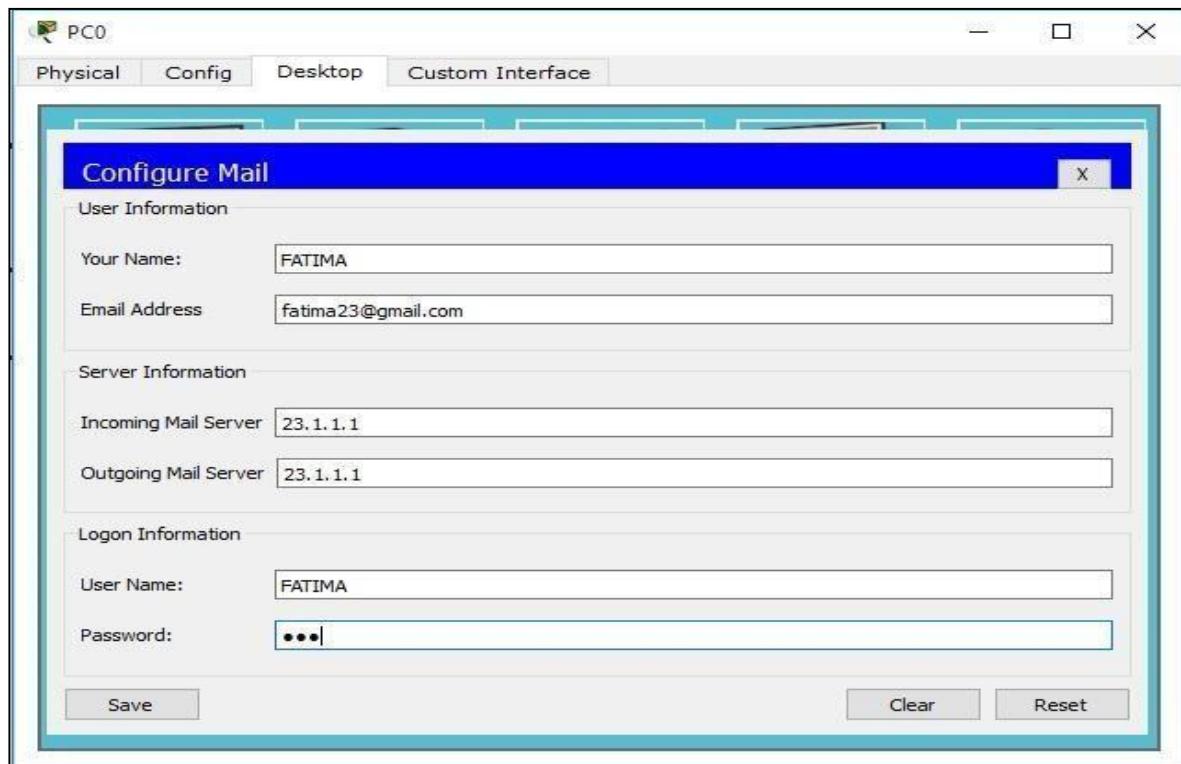


SMTP

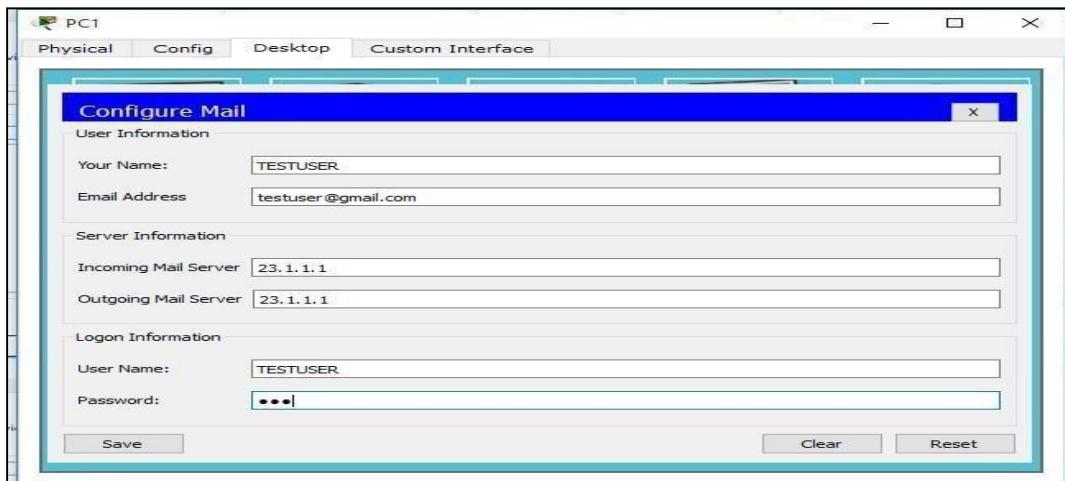
At server end, configure the EMAIL; add 2 users.



Set PC-0 according to first user's details (FATIMA).



Set PC-1 according to second user's details (TESTUSER).

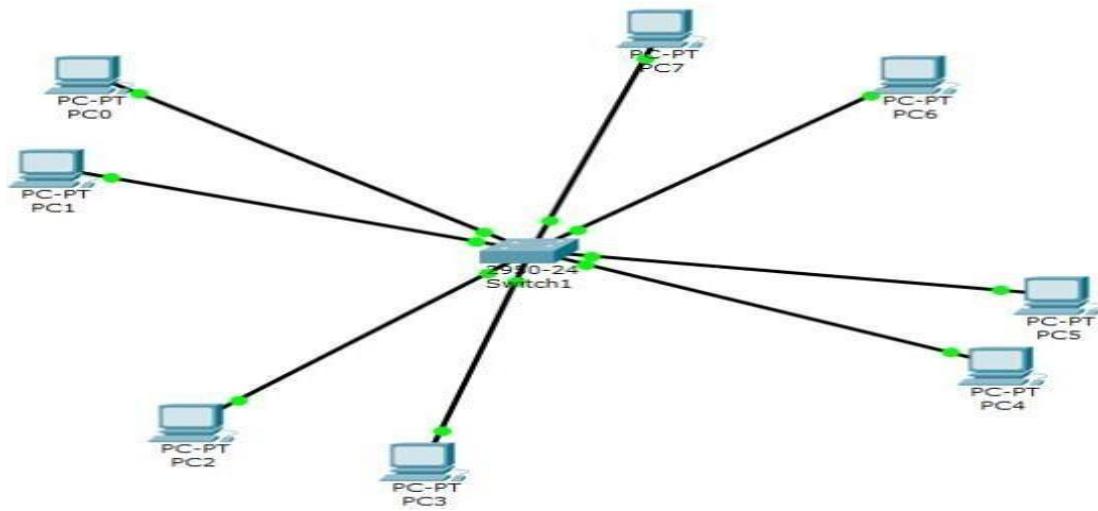


Send mail from FATIMA (PC-0) to TESTUSER (PC-1) and received.

The image displays two windows of the 'MAIL BROWSER' application. The left window, titled 'PC1', shows the 'Compose' screen with buttons for 'Compose', 'Reply', 'Receive', 'Delete', and 'Configure Mail'. Below these buttons is a table with columns 'From', 'Subject', and 'Received'. The right window, titled 'PC2', shows the 'Receive' screen with a similar table. A message at the bottom of the PC1 window states 'Sending mail to fatima1@fjwu.com , with subject : ghy .. Mail Server: 23.1.1.1 Send Success.' A message at the bottom of the PC2 window states 'Receiving mail from POP3 Server 23.1.1.1 Receive Mail Success.'

LAB#05

VLANS AND INTER-VLAN ROUTING



Making VLANS SWITCH

```
Switch>enable
Switch#show ip int brief
Interface          IP-Address      OK? Method Status           Protocol
FastEthernet0/1    unassigned      YES manual down
FastEthernet0/2    unassigned      YES manual down
FastEthernet0/3    unassigned      YES manual down
FastEthernet0/4    unassigned      YES manual down
FastEthernet0/5    unassigned      YES manual down
FastEthernet0/6    unassigned      YES manual down
FastEthernet0/7    unassigned      YES manual down
FastEthernet0/8    unassigned      YES manual down
FastEthernet0/9    unassigned      YES manual down
FastEthernet0/10   unassigned      YES manual down
```

```
Switch#show vlan brief
VLAN Name          Status     Ports
---- -----
1    default        active     Fa0/1, Fa0/2, Fa0/3, Fa0/4
                           Fa0/5, Fa0/6, Fa0/7, Fa0/8
                           Fa0/9, Fa0/10, Fa0/11, Fa0/12
                           Fa0/13, Fa0/14, Fa0/15, Fa0/16
                           Fa0/17, Fa0/18, Fa0/19, Fa0/20
                           Fa0/21, Fa0/22, Fa0/23, Fa0/24
1002 fddi-default   active
1003 token-ring-default active
1004 fddinet-default active
1005 trnet-default   active
```

```

Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#config terminal
^
* Invalid input detected at '^' marker.

Switch(config)#vlan 10
Switch(config-vlan)#name HR
Switch(config-vlan)#exit
Switch(config)#vlan 20
Switch(config-vlan)#Accounts
^
* Invalid input detected at '^' marker.

Switch(config-vlan)#name Accounts
Switch(config-vlan)#exit
Switch(config)#vlan 30
Switch(config-vlan)#name Admin
Switch(config-vlan)#exit
Switch(config)#vlan 23
Switch(config-vlan)#name Fatima
Switch(config-vlan)#exit
Switch(config)#show vlan brief
^

```

Switch#show vlan brief			
VLAN Name	Status	Ports	
1 default	active	Fa0/1, Fa0/2, Fa0/3, Fa0/4 Fa0/5, Fa0/6, Fa0/7, Fa0/8 Fa0/9, Fa0/10, Fa0/11, Fa0/12 Fa0/13, Fa0/14, Fa0/15, Fa0/16 Fa0/17, Fa0/18, Fa0/19, Fa0/20 Fa0/21, Fa0/22, Fa0/23, Fa0/24	
10 HR	active		
20 Accounts	active		
23 Fatima	active		
30 Admin	active		
1002 fddi-default	active		
1003 token-ring-default	active		
1004 fddinet-default	active		
1005 trnet-default	active		

Assigning Ethernet Ports to VLANs

```

Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#interface fa0/1
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 10
Switch(config-if)#interface range fa0/1-6
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 10
Switch(config-if-range)#exit
Switch(config)#end
Switch#
*SYS-5-CONFIG_I: Configured from console by console
show vlan brief

VLAN Name          Status      Ports
---- -----
1    default        active     Fa0/7, Fa0/8, Fa0/9, Fa0/10
                           Fa0/11, Fa0/12, Fa0/13, Fa0/14
                           Fa0/15, Fa0/16, Fa0/17, Fa0/18
                           Fa0/19, Fa0/20, Fa0/21, Fa0/22
                           Fa0/23, Fa0/24
10   HR             active     Fa0/1, Fa0/2, Fa0/3, Fa0/4
                           Fa0/5, Fa0/6
20   Accounts       active
23   Fatima         active
30   Admin           active
1002 fddi-default  active
1003 token-ring-default
1004 fddinet-default
1005 trnet-default  active
Switch#

```

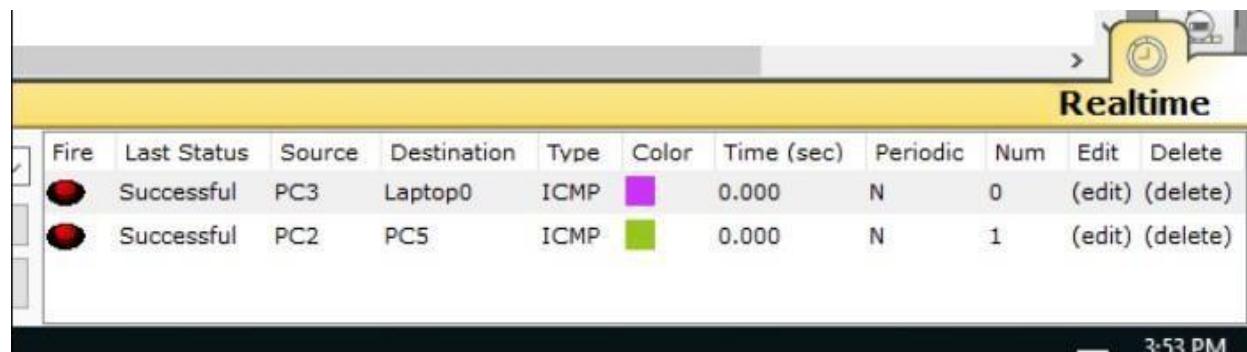
Assign ip addresses for all the pcs. Ping the ip addresses

```
Switch>enable
Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#interface range fastethernet 0/1-6
Switch(config-if-range)#switchport access mode
^
* Invalid input detected at '^' marker.
|
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access mode 10
^
* Invalid input detected at '^' marker.

Switch(config-if-range)#switchport acces vlan 10
Switch(config-if-range)#switchport acces vlan 20
Switch(config-if-range)#switchport acces vlan 30
Switch(config-if-range)#switchport acces vlan 23
Switch(config-if-range)#exit
Switch(config)#interface range fastethernet0/7-12
Switch(config-if-range)#switchport acces vlan 10
Switch(config-if-range)#switchport acces vlan 20
Switch(config-if-range)#switchport acces vlan 30
Switch(config-if-range)#switchport acces vlan 23
Switch(config-if-range)#exit
Switch(config)#interface range fastethernet0/13-18
Switch(config-if-range)#switchport acces vlan 10
Switch(config-if-range)#switchport acces vlan 20
Switch(config-if-range)#switchport acces vlan 30
Switch(config-if-range)#switchport acces vlan 23
Switch(config-if-range)#interface range fastethernet0/19-24
Switch(config-if-range)#switchport acces vlan 10
Switch(config-if-range)#switchport acces vlan 20
Switch(config-if-range)#switchport acces vlan 30
Switch(config-if-range)#switchport acces vlan 23
Switch(config-if-range)#exit
Switch(config)#exit
Switch#
```

Command Prompt

```
Pinging 1.1.1.1 with 32 bytes of data:  
  
Reply from 1.1.1.1: bytes=32 time=0ms TTL=128  
  
Ping statistics for 1.1.1.1:  
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),  
    Approximate round trip times in milli-seconds:  
        Minimum = 0ms, Maximum = 0ms, Average = 0ms  
  
PC>ping 1.1.1.8  
  
Pinging 1.1.1.8 with 32 bytes of data:  
  
Reply from 1.1.1.8: bytes=32 time=0ms TTL=128  
  
Ping statistics for 1.1.1.8:  
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),  
    Approximate round trip times in milli-seconds:  
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
```



The screenshot shows a network monitoring application window titled "Realtime". The interface includes a toolbar with icons for search, refresh, and other functions. The main area displays a table of recent network events:

	Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete
<input checked="" type="checkbox"/>	●	Successful	PC3	Laptop0	ICMP	■	0.000	N	0	(edit)	(delete)
<input type="checkbox"/>	●	Successful	PC2	PC5	ICMP	■	0.000	N	1	(edit)	(delete)

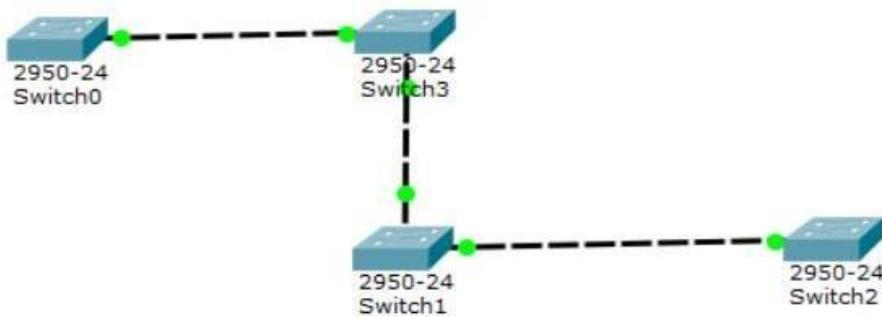
At the bottom right of the table, the time is displayed as 3:53 PM.

LAB#06

VIRTUAL TRUNKING PROTOCOL

Task 1: Understand and define the different modes of VTP and show in simulations.

NETWORK:



SERVER MODE:

```
Switch>enable
Switch#show vlan brief

VLAN Name          Status      Ports
----- 
1     default       active      Fa0/1, Fa0/2, Fa0/3, Fa0/4
                           Fa0/5, Fa0/6, Fa0/7, Fa0/8
                           Fa0/9, Fa0/10, Fa0/11, Fa0/12
                           Fa0/13, Fa0/14, Fa0/15, Fa0/16
                           Fa0/17, Fa0/18, Fa0/19, Fa0/20
                           Fa0/21, Fa0/22, Fa0/23, Fa0/24
1002 fddi-default   active
1003 token-ring-default   active
1004 fddinet-default   active
1005 trnet-default    active
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#vlan 10
Switch(config-vlan)#vname A
^
* Invalid input detected at '^' marker.

Switch(config-vlan)#exit
Switch(config)#vlan 20
Switch(config-vlan)#vname B
```

```

Switch#
Switch#show vlan brief

VLAN Name          Status    Ports
----              ----
1     default      active    Fa0/1, Fa0/2, Fa0/3, Fa0/4
                           Fa0/5, Fa0/6, Fa0/7, Fa0/8
                           Fa0/9, Fa0/10, Fa0/11, Fa0/12
                           Fa0/13, Fa0/14, Fa0/15, Fa0/16
                           Fa0/17, Fa0/18, Fa0/19, Fa0/20
                           Fa0/21, Fa0/22, Fa0/23, Fa0/24
10    A            active
20    B            active
1002  fddi-default active
1003  token-ring-default active
1004  fddinet-default active
1005  trnet-default   active
Switch#|


Switch(config)#vtp domain fizza
Changing VTP domain name from NULL to fizza
Switch(config)#end
Switch#
%SYS-5-CONFIG_I: Configured from console by console

Switch#
Switch#show vtp status
VTP Version          : 2
Configuration Revision : 0|
Maximum VLANs supported locally : 255
Number of existing VLANs : 7
VTP Operating Mode   : Server
VTP Domain Name      : fizza
VTP Pruning Mode     : Disabled
VTP V2 Mode          : Disabled
VTP Traps Generation : Disabled
MD5 digest           : 0xEC 0x9E 0x40 0x21 0x5A 0xD3 0x45 0x1C
Configuration last modified by 0.0.0.0 at 3-1-93 00:13:33
Local updater ID is 0.0.0.0 (no valid interface found)

Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#interface fastethernet 0/1
Switch(config-if)#switchport mode trunk

Switch(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to
down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to
up

Switch(config-if)#switchport trunk allowed vlan all
Switch(config-if)#end
Switch#
%SYS-5-CONFIG_I: Configured from console by console

Switch#show vtp status
VTP Version          : 2
Configuration Revision : 0
Maximum VLANs supported locally : 255
Number of existing VLANs : 7
VTP Operating Mode   : Server
VTP Domain Name      : fizza
VTP Pruning Mode     : Disabled
VTP V2 Mode          : Disabled
VTP Traps Generation : Disabled
MD5 digest           : 0xEC 0x9E 0x40 0x21 0x5A 0xD3 0x45 0x1C

```

```
Switch#show vtp status
VTP Version : 2
Configuration Revision : 4
Maximum VLANs supported locally : 255
Number of existing VLANs : 9
VTP Operating Mode : Server
VTP Domain Name : fizza
VTP Pruning Mode : Disabled
VTP V2 Mode : Disabled
VTP Traps Generation : Disabled
MD5 digest : 0x77 0xAB 0xCC 0xA8 0x23 0xD7 0xA8 0x51
Configuration last modified by 0.0.0.0 at 3-1-93 01:34:59
Local updater ID is 0.0.0.0 (no valid interface found)
Switch>
```

CLIENT MODE:

```
switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#vtp mode client
Device mode already VTP CLIENT.
```

```
Switch>show vtp status
VTP Version : 2
Configuration Revision : 0
Maximum VLANs supported locally : 255
Number of existing VLANs : 7
VTP Operating Mode : Client
VTP Domain Name : fizza
VTP Pruning Mode : Disabled
VTP V2 Mode : Disabled
VTP Traps Generation : Disabled
MD5 digest : 0xEC 0x9E 0x40 0x21 0x5A 0xD3 0x45 0x1C
Configuration last modified by 0.0.0.0 at 3-1-93 00:13:33
Switch>
```

```
Switch>show vtp status
VTP Version : 2
Configuration Revision : 4
Maximum VLANs supported locally : 255
Number of existing VLANs : 9
VTP Operating Mode : Client
VTP Domain Name : fizza
VTP Pruning Mode : Disabled
VTP V2 Mode : Disabled
VTP Traps Generation : Disabled
MD5 digest : 0x77 0xAB 0xCC 0xA8 0x23 0xD7 0xA8 0x51
Configuration last modified by 0.0.0.0 at 3-1-93 01:34:59
Switch>
```

TRANSPARENT MODE:

```

Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#vtp mode transparent
Setting device to VTP TRANSPARENT mode.
Switch(config)#exit
Switch#
%SYS-5-CONFIG_I: Configured from console by console

Switch#
Switch#show vtp status
VTP Version : 2
Configuration Revision : 0
Maximum VLANs supported locally : 255
Number of existing VLANs : 5
VTP Operating Mode : Transparent
VTP Domain Name : fizza
VTP Pruning Mode : Disabled
VTP V2 Mode : Disabled
VTP Traps Generation : Disabled
MDS digest : 0xE0 0xDD 0x83 0xB5 0xCF 0xA8 0x54 0xB4
Configuration last modified by 0.0.0.0 at 0-0-00 00:00:00
Switch#
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#interface fastethernet 0/1
Switch(config-if)#switchport mode trunk
Switch(config-if)#switchport trunk allowed vlan all
Switch(config-if)#exit
Switch(config)#interface fastethernet 0/2
Switch(config-if)#switchport mode trunk
Switch(config-if)#switchport trunk allowed vlan all
Switch(config-if)#end

```

SERVER MODE 02:

```
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#vlan 12
Switch(config-vlan)#name C
Switch(config-vlan)#vlan 13
Switch(config-vlan)#name D
Switch(config-vlan)#end
Switch#
%SYS-5-CONFIG_I: Configured from console by console

Switch#show vlan brief

VLAN Name          Status      Ports
----  -----
1    default        active      Fa0/1, Fa0/2, Fa0/3, Fa0/4
                                Fa0/5, Fa0/6, Fa0/7, Fa0/8
                                Fa0/9, Fa0/10, Fa0/11, Fa0/12
                                Fa0/13, Fa0/14, Fa0/15, Fa0/16
                                Fa0/17, Fa0/18, Fa0/19, Fa0/20
                                Fa0/21, Fa0/22, Fa0/23, Fa0/24
12   C              active
13   D              active
1002 fddi-default   active
1003 token-ring-default   active
1004 fddinet-default   active
1005 trnet-default    active
Switch#



Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#vtp domain pizza
Changing VTP domain name from NULL to pizza
Switch(config)#end
Switch#
%SYS-5-CONFIG_I: Configured from console by console

Switch#show vtp status
VTP Version           : 2
Configuration Revision : 0
Maximum VLANs supported locally : 255
Number of existing VLANs : 7
VTP Operating Mode   : Server
VTP Domain Name      : pizza
VTP Pruning Mode     : Disabled
VTP V2 Mode           : Disabled
VTP Traps Generation : Disabled
MD5 digest            : 0x0C 0x5B 0x4E 0xB4 0x1A 0x5A 0x74 0xA1
Configuration last modified by 0.0.0.0 at 3-1-93 00:42:39
Local updater ID is 0.0.0.0 (no valid interface found)
Switch#

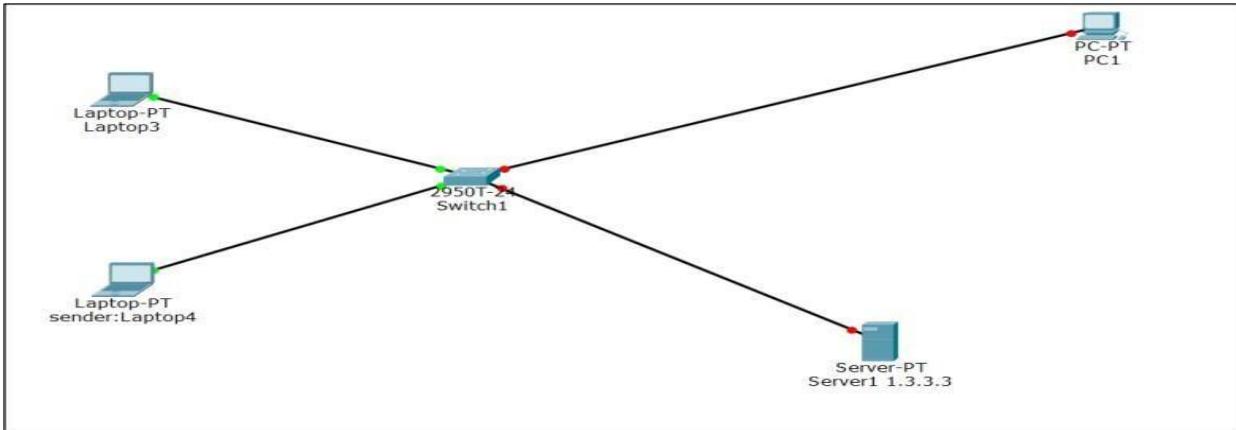


Switch#show vtp status
VTP Version           : 2
Configuration Revision : 4
Maximum VLANs supported locally : 255
Number of existing VLANs : 9
VTP Operating Mode   : Server
VTP Domain Name      : pizza
VTP Pruning Mode     : Disabled
VTP V2 Mode           : Disabled
VTP Traps Generation : Disabled
MD5 digest            : 0x77 0xAB 0xCC 0xA8 0x23 0xD7 0xA8 0x51
Configuration last modified by 0.0.0.0 at 3-1-93 01:34:59
Local updater ID is 0.0.0.0 (no valid interface found)
Switch#
```

LAB#07

SWITCH PORT SECURITY

NETWORKS



```
Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int fa0/2
Switch(config-if)#switchport mode access
Switch(config-if)#switchport port-security
Switch(config-if)#switchport port-security maximum 1
Switch(config-if)#switchport port-security mac-address sticky
Switch(config-if)#switchport port-security violation shutdown
Switch(config-if)#endd
^
% Invalid input detected at '^' marker.

Switch(config-if)#end
Switch#
%SYS-5-CONFIG_I: Configured from console by console

Switch#show po
Secure Port MaxSecureAddr CurrentAddr SecurityViolation Security Action
          (Count)      (Count)      (Count)
-----
Fa0/2        1           0           0           Shutdown

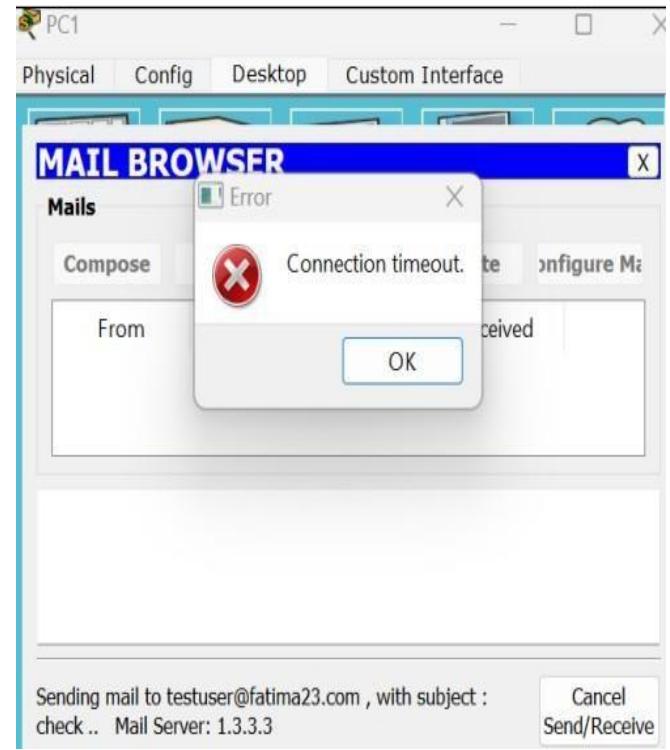
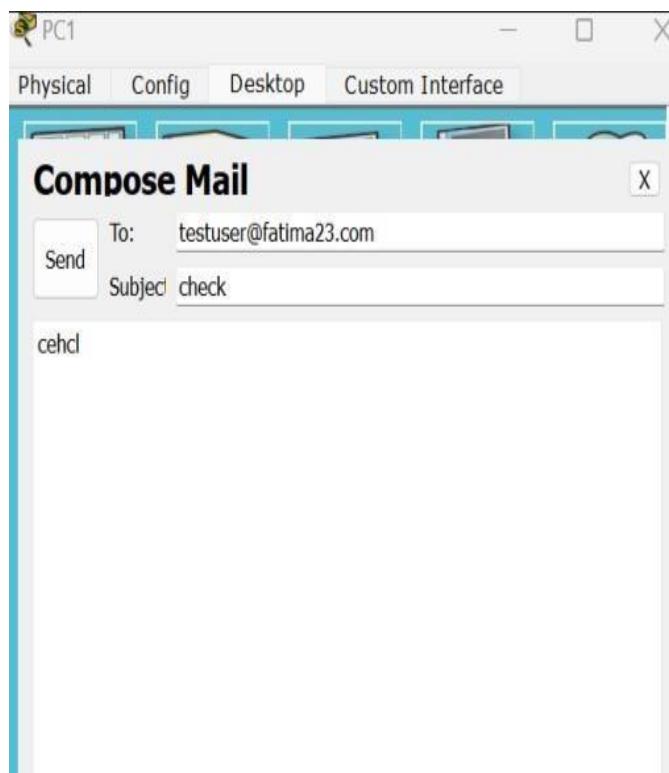
Switch#show port-security int fa0/2
Port Security      : Enabled
Port Status        : Secure-up
Violation Mode    : Shutdown
Aging Time         : 0 mins
Aging Type         : Absolute
SecureStatic Address Aging : Disabled
Maximum MAC Addresses : 1
Total MAC Addresses : 0
Configured MAC Addresses : 0
Sticky MAC Addresses : 0
Last Source Address:Vlan : 0000.0000.0000:0
Security Violation Count : 0

Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int range fa0/3-24
Switch(config-if-range)#shutdown
```

```

%LINK-5-CHANGED: Interface FastEthernet0/14, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/15, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/16, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/17, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/18, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/19, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/20, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/21, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/22, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/23, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/24, changed state to administratively down
Switch(config-if-range)#
%LINK-5-CHANGED: Interface FastEthernet0/3, changed state to administratively down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to down
Switch(config-if-range)#end
Switch#
%SYS-5-CONFIG_I: Configured from console by console
Switch#show po
Secure Port MaxSecureAddr CurrentAddr SecurityViolation Security Action
(Count) (Count) (Count)
-----
Fa0/2 1 0 0 Shutdown
-----
Switch#

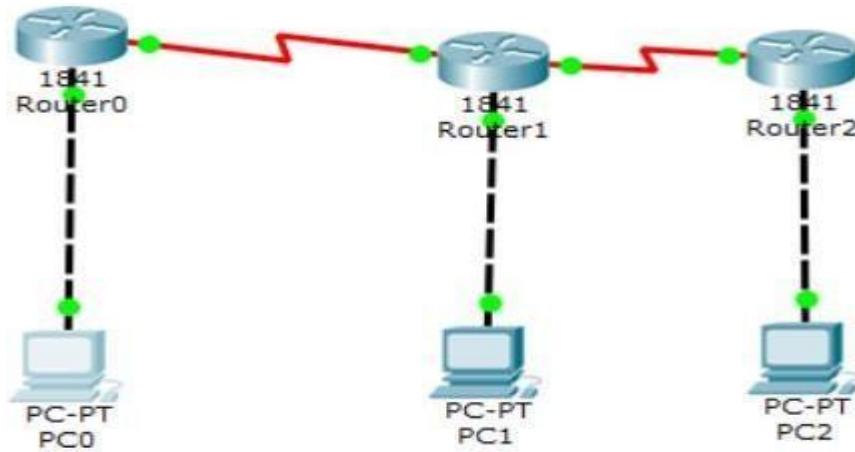
```



LAB#08

STATIC ROUTING

TASK 1: Implement Static Routing for following topology:



IP CONFIGURATION PC 0

PC0

Physical Config Desktop Custom Interface

IP Configuration

IP Configuration

DHCP Static

IP Address: 192.168.1.2
Subnet Mask: 255.255.255.0
Default Gateway: 192.168.1.3
DNS Server: [empty]

IPv6 Configuration

DHCP Auto Config Static

IPv6 Address: [empty] / [empty]
Link Local Address: FE80::201:43FF:FE8E:7A23
IPv6 Gateway: [empty]
IPv6 DNS Server: [empty]

IP CONFIGURATION PC 1

PC1

Physical Config Desktop Custom Interface

IP Configuration

IP Configuration

DHCP Static

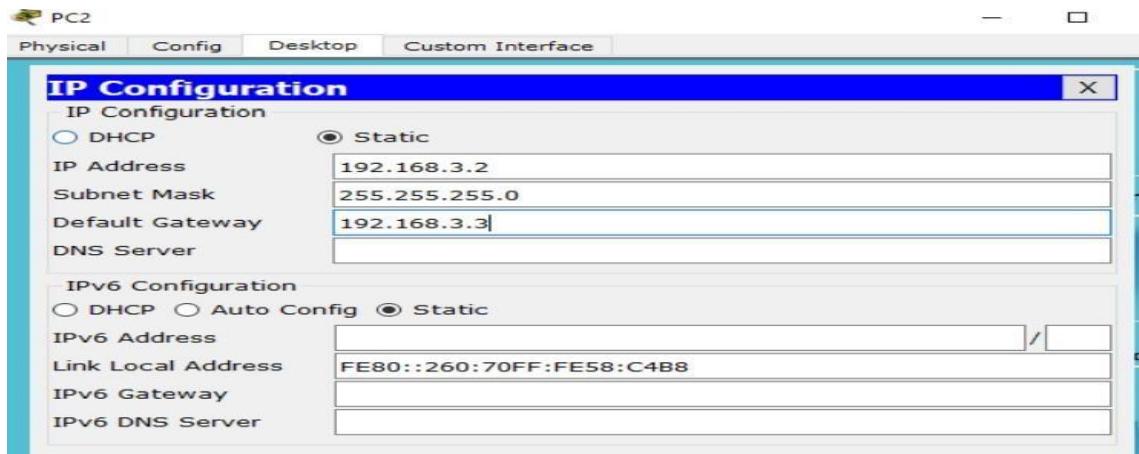
IP Address: 192.168.2.2
Subnet Mask: 255.255.255.0
Default Gateway: 192.168.2.3
DNS Server: [empty]

IPv6 Configuration

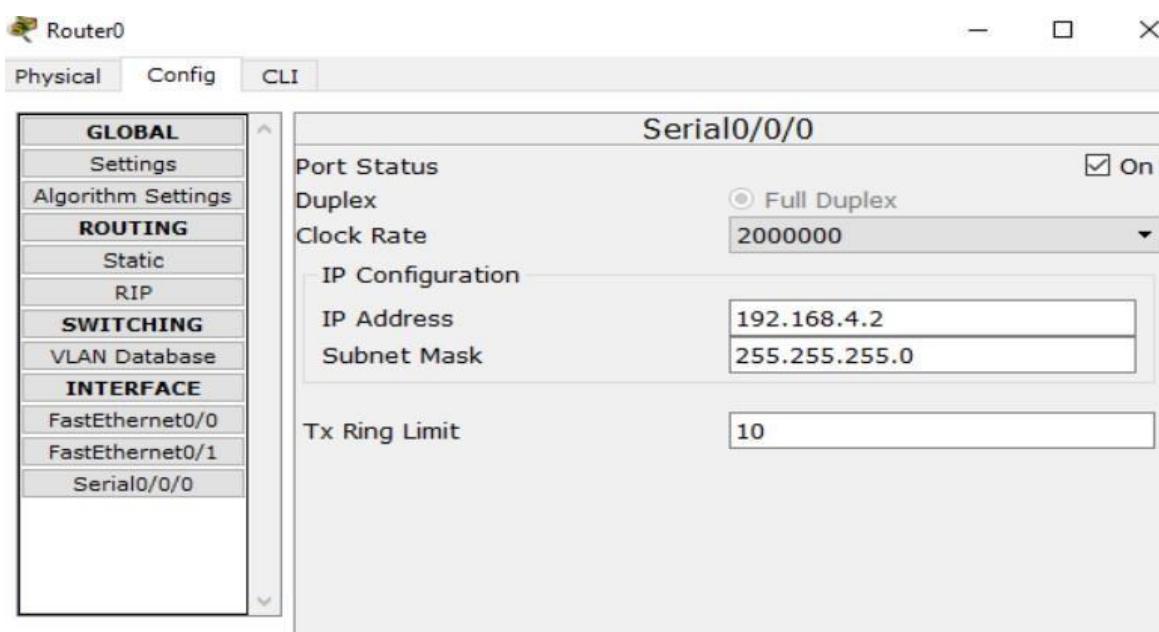
DHCP Auto Config Static

IPv6 Address: [empty] / [empty]
Link Local Address: FE80::210:11FF:FE8E:238B
IPv6 Gateway: [empty]
IPv6 DNS Server: [empty]

IP CONFIGURATION PC 2



ROUTER 0



Router0 Configuration - FastEthernet0/0

- GLOBAL**: Settings, Algorithm Settings, ROUTING (Static, RIP), SWITCHING, VLAN Database, INTERFACE (FastEthernet0/0, FastEthernet0/1, Serial0/0/0).
- Port Status**: On (checked), Bandwidth (100 Mbps selected), Duplex (Half Duplex selected), MAC Address (0040.0BAE.0701).
- IP Configuration**: IP Address (192.168.1.3), Subnet Mask (255.255.255.0), Tx Ring Limit (10).

Router0 Configuration - Static Routes

- GLOBAL**: Settings, Algorithm Settings, ROUTING (Static, RIP), SWITCHING, VLAN Database, INTERFACE (FastEthernet0/0, FastEthernet0/1, Serial0/0/0).
- Network**: Network (192.168.5.0), Mask (255.255.255.0), Next Hop (192.168.4.3).
- Add** button.
- Network Address**: 192.168.2.0/24 via 192.168.4.3, 192.168.3.0/24 via 192.168.4.3, 192.168.5.0/24 via 192.168.4.3.
- Remove** button.

ROUTER 1

Router1 Configuration - Serial0/0/0

- GLOBAL**: Settings, Algorithm Settings, ROUTING (Static, RIP), SWITCHING, VLAN Database, INTERFACE (FastEthernet0/0, FastEthernet0/1, Serial0/0/0, Serial0/1/0).
- Port Status**: On (checked), Duplex (Full Duplex selected), Clock Rate (Not Set).
- IP Configuration**: IP Address (192.168.4.3), Subnet Mask (255.255.255.0), Tx Ring Limit (10).

Router1 Configuration - Serial0/1/0

- GLOBAL**: Settings, Algorithm Settings, ROUTING (Static, RIP), SWITCHING, VLAN Database, INTERFACE (FastEthernet0/0, FastEthernet0/1, Serial0/0/0, Serial0/1/0).
- Port Status**: On (checked), Duplex (Full Duplex selected), Clock Rate (2000000).
- IP Configuration**: IP Address (192.168.5.2), Subnet Mask (255.255.255.0), Tx Ring Limit (10).

Router1 Configuration Screenshots

Left Window: FastEthernet0/0 Configuration

- GLOBAL:** Settings, Algorithm Settings, **ROUTING:** Static, RIP, **SWITCHING:** VLAN Database, **INTERFACE:** FastEthernet0/0, FastEthernet0/1, Serial0/0/0, Serial0/1/0.
- FastEthernet0/0 Details:**
 - Port Status: On
 - Bandwidth: 100 Mbps (radio button selected)
 - Duplex: Half Duplex (radio button selected)
 - MAC Address: 00D0.BA47.3101
 - IP Configuration:
 - IP Address: 192.168.2.3
 - Subnet Mask: 255.255.255.0
 - Tx Ring Limit: 10

Right Window: Static Routes

- GLOBAL:** Settings, Algorithm Settings, **ROUTING:** Static, RIP, **SWITCHING:** VLAN Database, **INTERFACE:** FastEthernet0/0, FastEthernet0/1, Serial0/0/0, Serial0/1/0.
- Static Routes:**
 - Network: 192.168.3.0, Mask: 255.255.255.0, Next Hop: 192.168.5.3, Add button
 - Network Address: 192.168.1.0/24 via 192.168.4.2
 - Network Address: 192.168.3.0/24 via 192.168.5.3

ROUTER 2

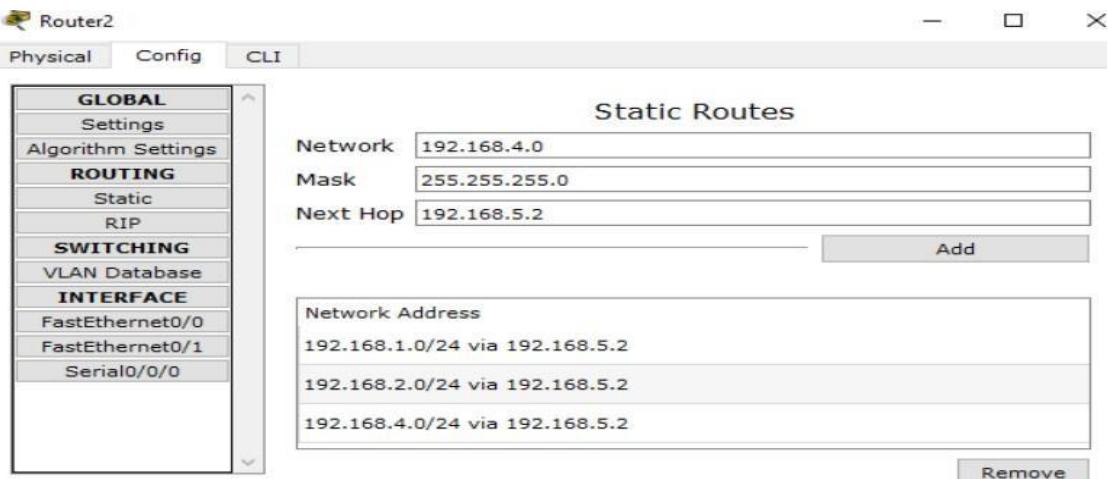
Router2 Configuration Screenshots

Left Window: FastEthernet0/0 Configuration

- GLOBAL:** Settings, Algorithm Settings, **ROUTING:** Static, RIP, **SWITCHING:** VLAN Database, **INTERFACE:** FastEthernet0/0, FastEthernet0/1, Serial0/0/0.
- FastEthernet0/0 Details:**
 - Port Status: On
 - Bandwidth: 100 Mbps (radio button selected)
 - Duplex: Half Duplex (radio button selected)
 - MAC Address: 00E0.F99D.5101
 - IP Configuration:
 - IP Address: 192.168.3.3
 - Subnet Mask: 255.255.255.0
 - Tx Ring Limit: 10

Right Window: Serial0/0/0 Configuration

- GLOBAL:** Settings, Algorithm Settings, **ROUTING:** Static, RIP, **SWITCHING:** VLAN Database, **INTERFACE:** FastEthernet0/0, FastEthernet0/1, Serial0/0/0.
- Serial0/0/0 Details:**
 - Port Status: On
 - Duplex: Full Duplex (radio button selected)
 - Clock Rate: Not Set
 - IP Configuration:
 - IP Address: 192.168.5.3
 - Subnet Mask: 255.255.255.0
 - Tx Ring Limit: 10



COMMUNICATION OF PC0, WITH PC1 & PC2

The screenshot shows the Command Prompt window for PC0. The user has run several ping commands:

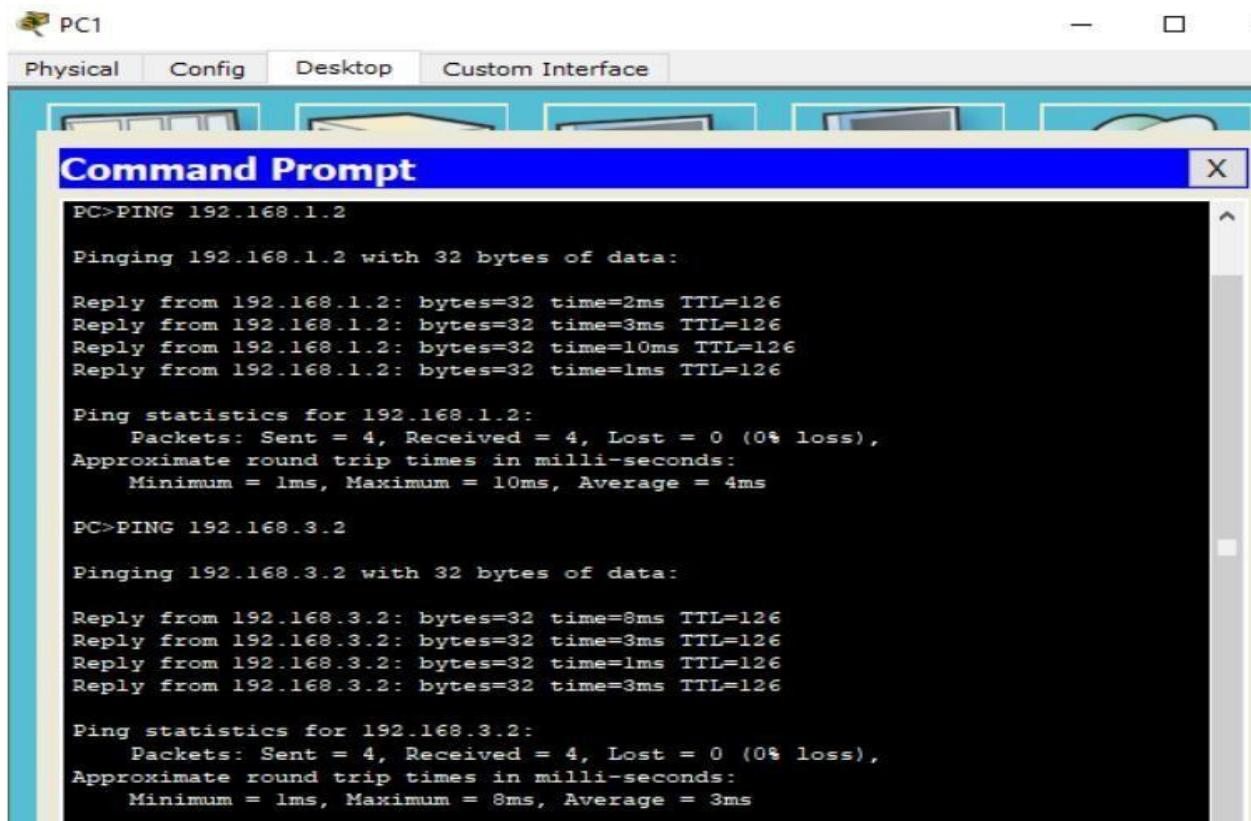
```
PC>ping 192.168.2.2
Pinging 192.168.2.2 with 32 bytes of data:
Reply from 192.168.2.2: bytes=32 time=8ms TTL=126
Reply from 192.168.2.2: bytes=32 time=1ms TTL=126
Reply from 192.168.2.2: bytes=32 time=1ms TTL=126
Reply from 192.168.2.2: bytes=32 time=1ms TTL=126

Ping statistics for 192.168.2.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 8ms, Average = 2ms

PC>ping 192.168.3.2
Pinging 192.168.3.2 with 32 bytes of data:
Request timed out.
Reply from 192.168.3.2: bytes=32 time=11ms TTL=125
Reply from 192.168.3.2: bytes=32 time=14ms TTL=125
Reply from 192.168.3.2: bytes=32 time=11ms TTL=125

Ping statistics for 192.168.3.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 11ms, Maximum = 14ms, Average = 12ms
```

COMMUNICATION OF PC1, WITH PC0 & PC2



PC1

Physical Config Desktop Custom Interface

Command Prompt

```
PC>PING 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time=2ms TTL=126
Reply from 192.168.1.2: bytes=32 time=3ms TTL=126
Reply from 192.168.1.2: bytes=32 time=10ms TTL=126
Reply from 192.168.1.2: bytes=32 time=1ms TTL=126

Ping statistics for 192.168.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 10ms, Average = 4ms

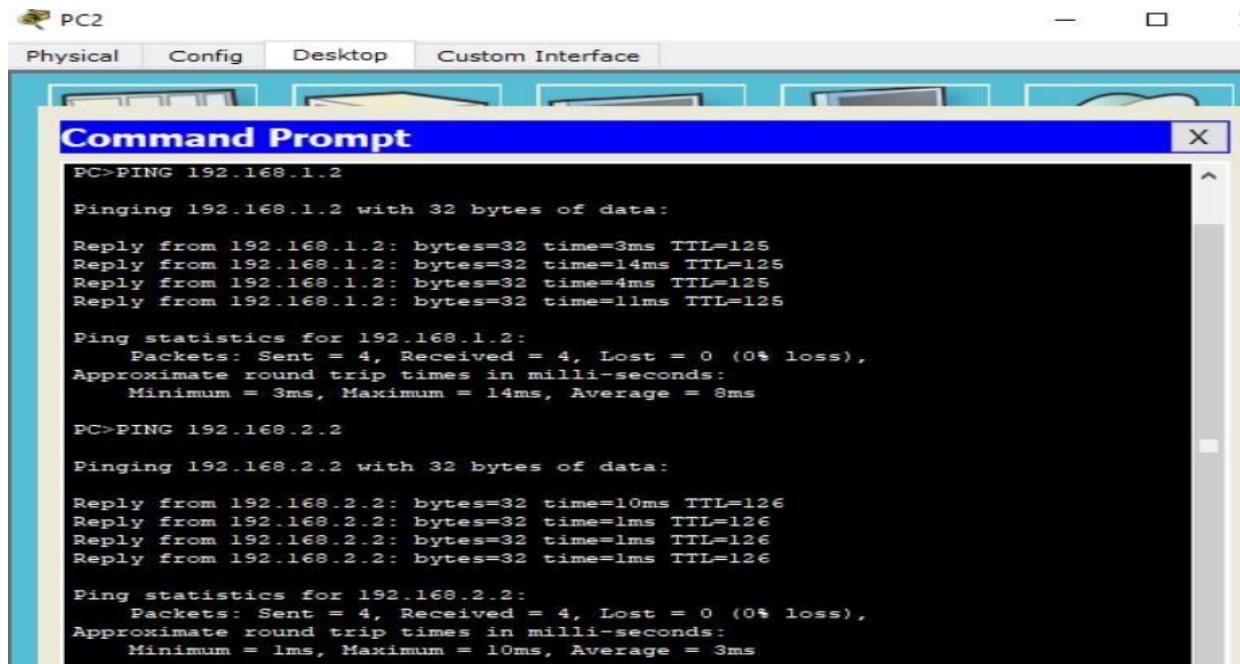
PC>PING 192.168.3.2

Pinging 192.168.3.2 with 32 bytes of data:

Reply from 192.168.3.2: bytes=32 time=8ms TTL=126
Reply from 192.168.3.2: bytes=32 time=3ms TTL=126
Reply from 192.168.3.2: bytes=32 time=1ms TTL=126
Reply from 192.168.3.2: bytes=32 time=3ms TTL=126

Ping statistics for 192.168.3.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 8ms, Average = 3ms
```

COMMUNICATION OF PC2, WITH PC0 & PC1



PC2

Physical Config Desktop Custom Interface

Command Prompt

```
PC>PING 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time=3ms TTL=125
Reply from 192.168.1.2: bytes=32 time=14ms TTL=125
Reply from 192.168.1.2: bytes=32 time=4ms TTL=125
Reply from 192.168.1.2: bytes=32 time=11ms TTL=125

Ping statistics for 192.168.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 3ms, Maximum = 14ms, Average = 8ms

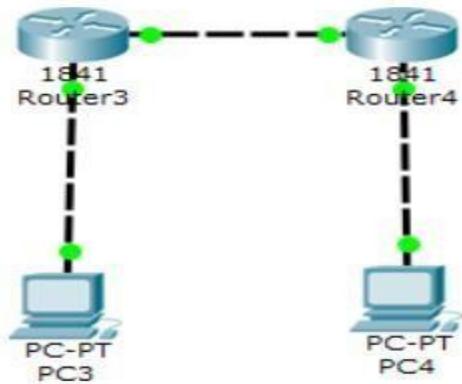
PC>PING 192.168.2.2

Pinging 192.168.2.2 with 32 bytes of data:

Reply from 192.168.2.2: bytes=32 time=10ms TTL=126
Reply from 192.168.2.2: bytes=32 time=1ms TTL=126
Reply from 192.168.2.2: bytes=32 time=1ms TTL=126
Reply from 192.168.2.2: bytes=32 time=1ms TTL=126

Ping statistics for 192.168.2.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 10ms, Average = 3ms
```

TASK 2: Implement Static Routing for following topology:



IP CONFIGURATION PC4

PC3

Physical Config Desktop Custom Interface

IP Configuration

IP Configuration

DHCP Static

IP Address: 192.168.6.2
Subnet Mask: 255.255.255.0
Default Gateway: 192.168.6.3
DNS Server: [empty]

IPv6 Configuration

DHCP Auto Config Static

IPv6 Address: [empty] / [empty]
Link Local Address: FE80::204:9AFF:FEA1:EB62
IPv6 Gateway: [empty]
IPv6 DNS Server: [empty]

IP CONFIGURATION PC3

PC4

Physical Config Desktop Custom Interface

IP Configuration

IP Configuration

DHCP Static

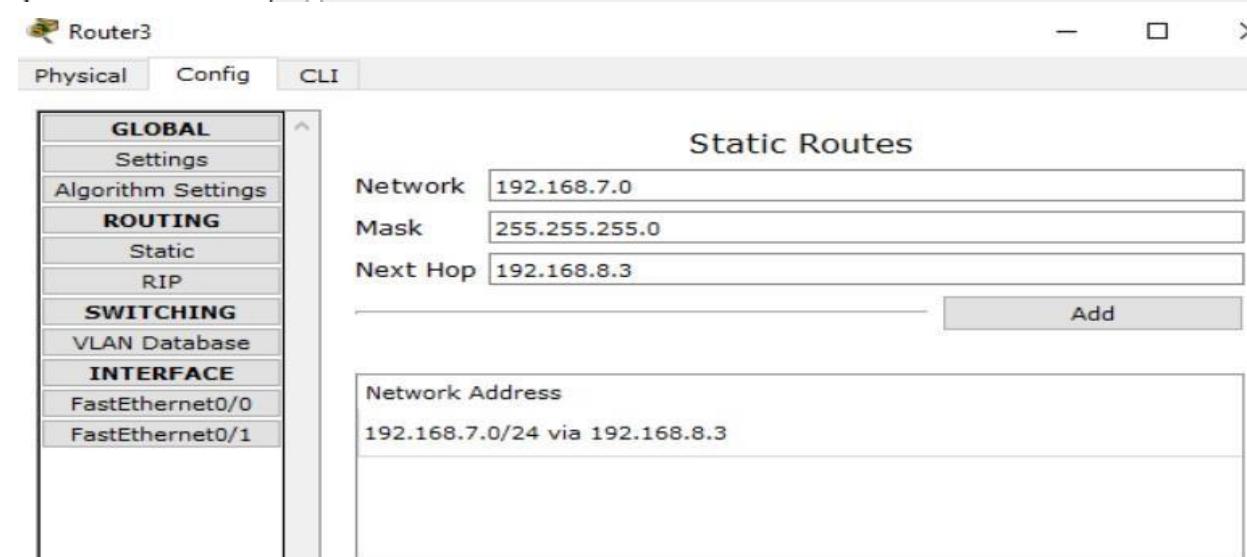
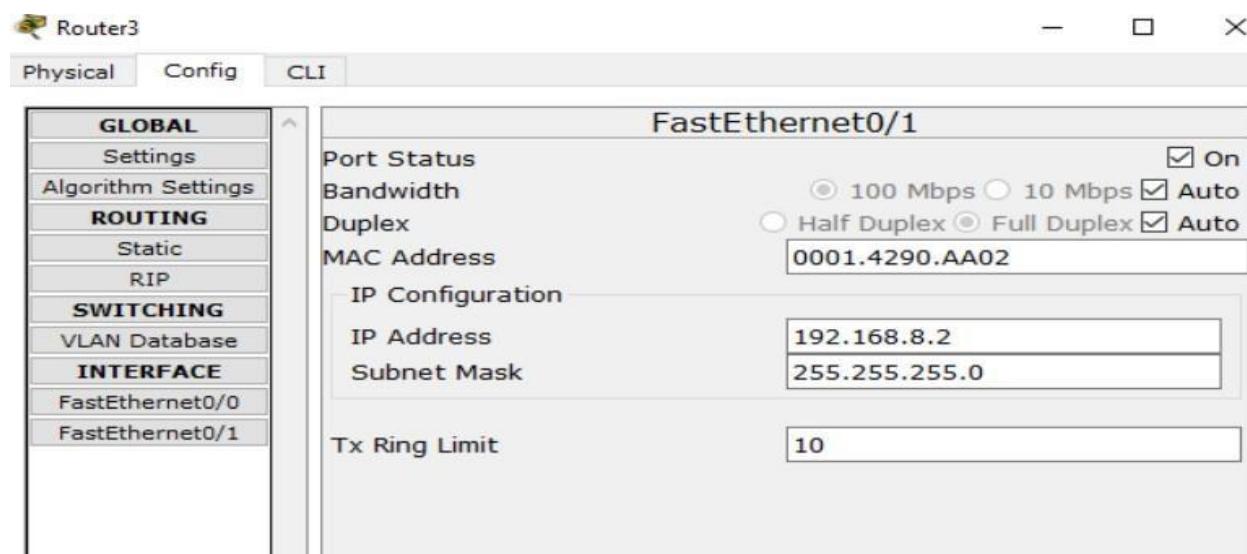
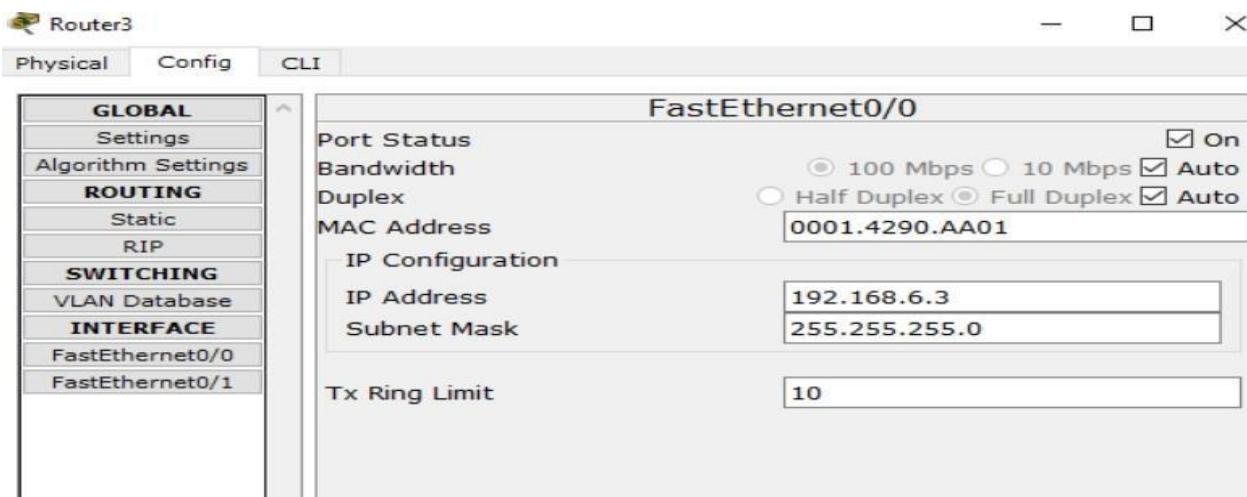
IP Address: 192.168.7.2
Subnet Mask: 255.255.255.0
Default Gateway: 192.168.7.3
DNS Server: [empty]

IPv6 Configuration

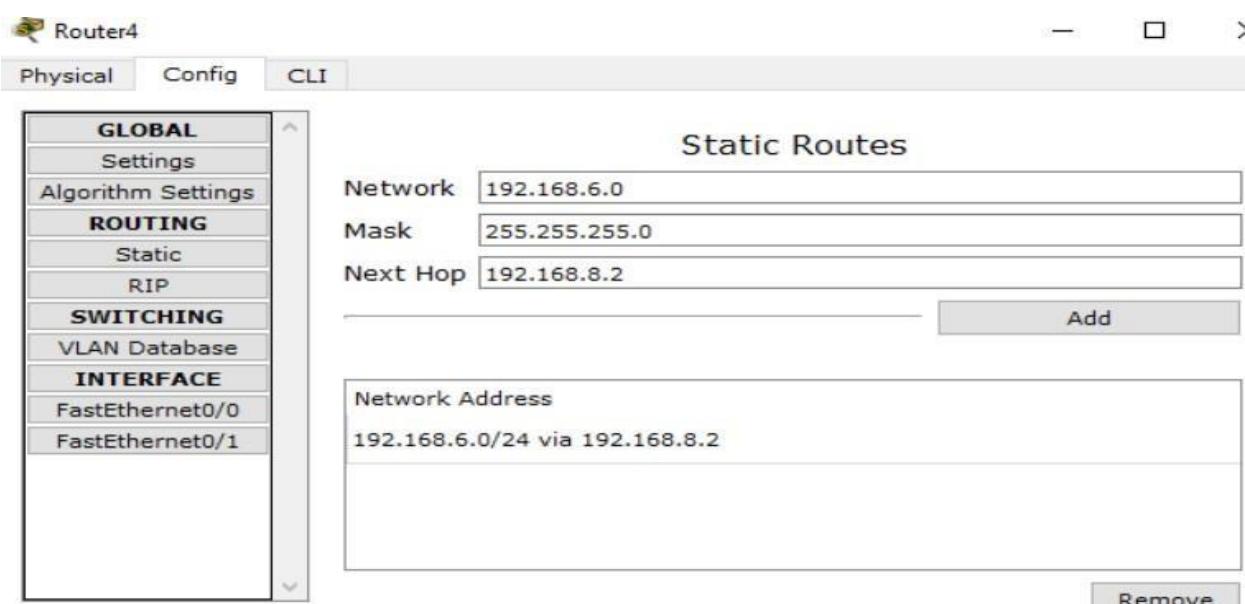
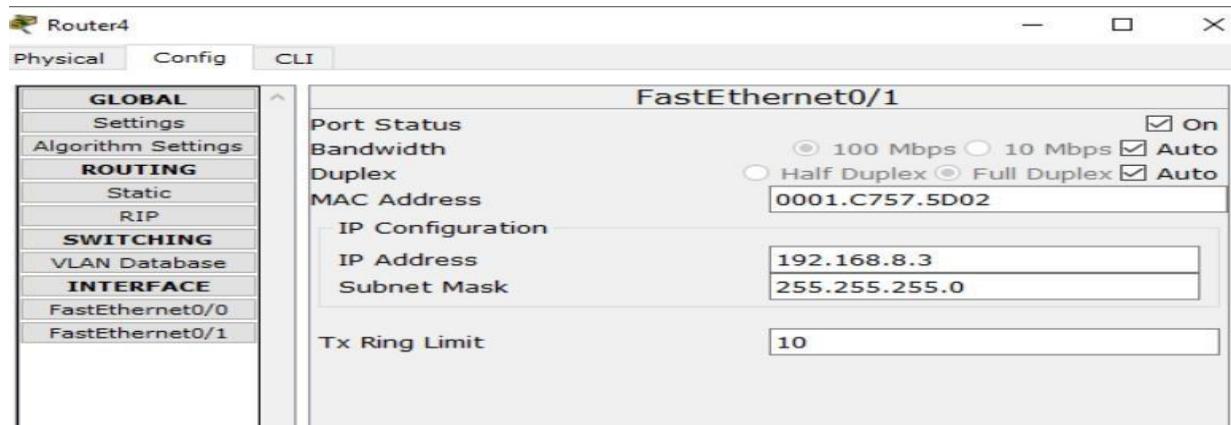
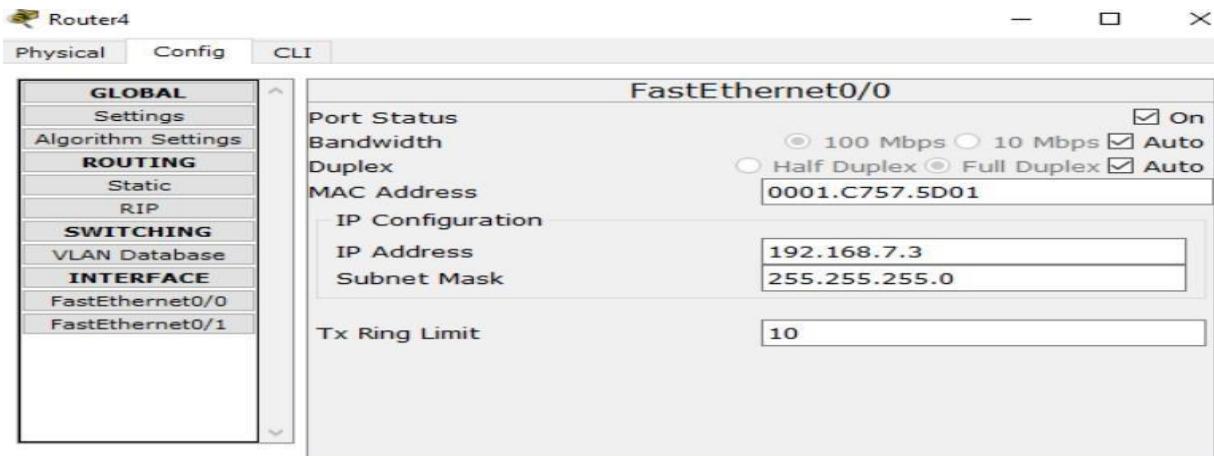
DHCP Auto Config Static

IPv6 Address: [empty] / [empty]
Link Local Address: FE80::201:C9FF:FEB3:33C0
IPv6 Gateway: [empty]
IPv6 DNS Server: [empty]

CONFIGURATION OF ROUTER3



CONFIGURATION OF ROUTER4



COMMUNICATION BETWEEN PCS

PC3

Physical Config Desktop Custom Interface

Command Prompt

```
PC>PING 192.168.7.2

Pinging 192.168.7.2 with 32 bytes of data:

Reply from 192.168.7.2: bytes=32 time=1ms TTL=126
Reply from 192.168.7.2: bytes=32 time=0ms TTL=126
Reply from 192.168.7.2: bytes=32 time=1ms TTL=126
Reply from 192.168.7.2: bytes=32 time=0ms TTL=126

Ping statistics for 192.168.7.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

PC4

Physical Config Desktop Custom Interface

Command Prompt

```
Packet Tracer PC Command Line 1.0
PC>PING 192.168.6.2

Pinging 192.168.6.2 with 32 bytes of data:

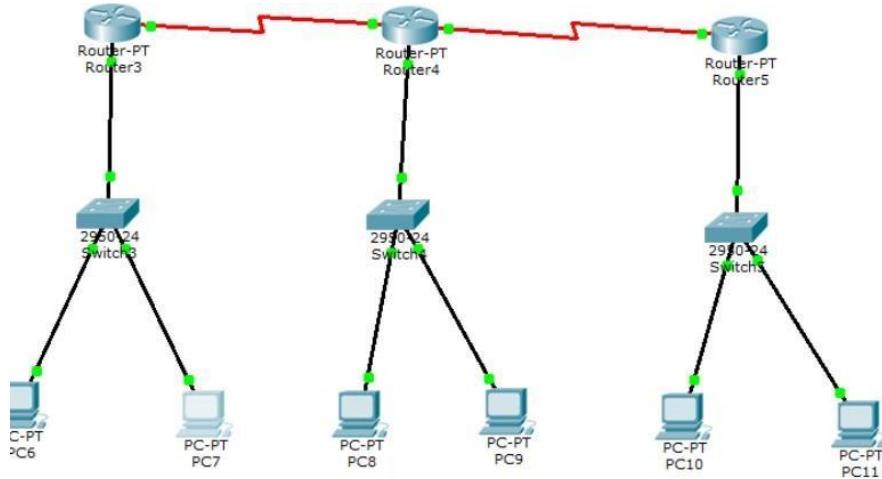
Reply from 192.168.6.2: bytes=32 time=0ms TTL=126

Ping statistics for 192.168.6.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

PC>
```

LAB#09

ROUTING INFORMATION PROTOCOL (RIP)



Router 1

```
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface Serial2/0
Router(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial2/0, changed state to down
Router(config-if)#ip address 10.0.0.1 255.0.0.0
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed sta
o up

Router(config-if)#ip address 11.0.0.1 255.0.0.1
Bad mask 0xFF000001 for address 11.0.0.1
Router(config-if)#ip address 11.0.0.1 255.0.0.0
Router(config-if)#exit
-
```

```

Router(config)#router rip
Router(config-router)#network 10.0.0.0
Router(config-router)#network 11.0.0.0
Router(config-router)#^Z
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
      D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
      N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
      E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
      i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
      * - candidate default, U - per-user static route, o - ODR
      P - periodic downloaded static route

Gateway of last resort is not set

C    11.0.0.0/8 is directly connected, FastEthernet0/0
Router#

```

Router 2:

```

Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface serial2/0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

Router(config-if)#ip address
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed

% Incomplete command.
Router(config-if)#ip address 10.0.0.2 255.0.0.0
Router(config-if)#exit

Router(config)#interface serial2/0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

Router(config-if)#ip address
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up

% Incomplete command.
Router(config-if)#ip address 10.0.0.2 255.0.0.0
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
o up

Router(config-if)#ip address 12.0.0.1 255.0.0.0
Router(config-if)#exit

```

```
Router(config)#router rip
Router(config-router)#network 10.0.0.0
Router(config-router)#network 12.0.0.0
Router(config-router)#^Z
Router#
*SYS-5-CONFIG_I: Configured from console by console

Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface se3/0
Router(config-if)#no shutdown

*LINK-5-CHANGED: Interface Serial3/0, changed state to down
Router(config-if)#ip address 13.0.0.1 255.0.0.0
Router(config-if)#wxit
^
* Invalid input detected at '^' marker.

Router(config-if)#end
Router#

Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
      D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
      N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
      E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
      i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
      * - candidate default, U - per-user static route, o - ODR
      P - periodic downloaded static route
```

Gateway of last resort is not set

```
C    10.0.0.0/8 is directly connected, Serial2/0
R    11.0.0.0/8 [120/1] via 10.0.0.1, 00:00:01, Serial2/0
C    12.0.0.0/8 is directly connected, FastEthernet0/0
Router#
```

Router 03

```
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface se2/0
Router(config-if)#no shutdown
Router(config-if)#ip address 13.0.0.2 255.0.0.0
Router(config-if)#exit
Router(config)#interface FastEthernet 0/0
Router(config-if)#no shutdown

Router(config-if)#
*LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

*LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to
o up

Router(config-if)#ip address 14.0.0.1 255.0.0.0
Router(config-if)#router rip
Router(config-router)#network 13.0.0.0
Router(config-router)#network 14.0.0.0
Router(config-router)#^Z

Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
      D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
      N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
      E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
      i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
      * - candidate default, U - per-user static route, o - ODR
      P - periodic downloaded static route

Gateway of last resort is not set

R    10.0.0.0/8 [120/1] via 13.0.0.1, 00:00:07, Serial2/0
R    11.0.0.0/8 [120/2] via 13.0.0.1, 00:00:07, Serial2/0
R    12.0.0.0/8 [120/1] via 13.0.0.1, 00:00:07, Serial2/0
C    13.0.0.0/8 is directly connected, Serial2/0
C    14.0.0.0/8 is directly connected, FastEthernet0/0
Router#
```

PINGING

PC6

IP Configuration

IP Configuration		
<input type="radio"/> DHCP	<input checked="" type="radio"/> Static	
IP Address	11.0.0.2	
Subnet Mask	255.0.0.0	
Default Gateway	11.0.0.1	
DNS Server		
IPv6 Configuration		
<input type="radio"/> DHCP	<input type="radio"/> Auto Config	<input checked="" type="radio"/> Static
IPv6 Address	/	
Link Local Address	FE80::201:C9FF:FE1D:868C	
IPv6 Gateway		
IPv6 DNS Server		

PC10

IP Configuration

IP Configuration		
<input type="radio"/> DHCP	<input checked="" type="radio"/> Static	
IP Address	14.0.0.2	
Subnet Mask	255.0.0.0	
Default Gateway	14.0.0.1	
DNS Server		
IPv6 Configuration		
<input type="radio"/> DHCP	<input type="radio"/> Auto Config	<input checked="" type="radio"/> Static
IPv6 Address	/	
Link Local Address	FE80::20D:BDFF:FE29:6B57	
IPv6 Gateway		
IPv6 DNS Server		

Command Prompt

```
Packet Tracer PC Command Line 1.0
PC>ping 14.0.0.3

Pinging 14.0.0.3 with 32 bytes of data:

Request timed out.
Reply from 14.0.0.3: bytes=32 time=2ms TTL=125
Reply from 14.0.0.3: bytes=32 time=2ms TTL=125
Reply from 14.0.0.3: bytes=32 time=2ms TTL=125

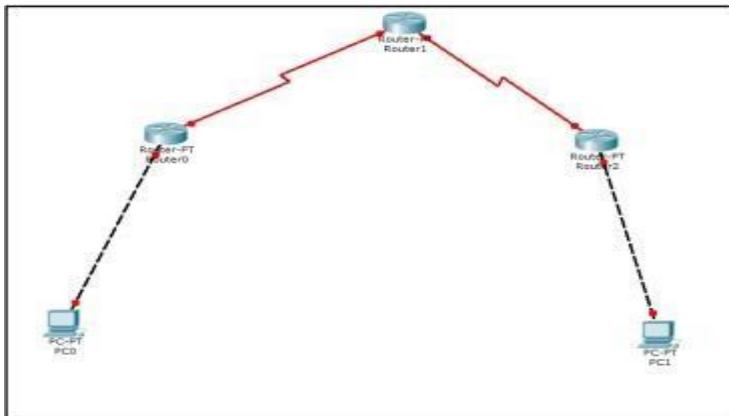
Ping statistics for 14.0.0.3:
  Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
  Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 2ms, Average = 2ms

PC>
```

LAB#10

OPEN SHORTEST-PATH IRST (OSPF)

Create a network.



Assign ip addresses.

PC0

IP Configuration

IP Configuration

DHCP Static

IP Address **192.168.1.2**

Subnet Mask **255.255.255.0**

Default Gateway **192.168.1.1**

DNS Server

IPv6 Configuration

DHCP Auto Config Static

IPv6 Address /

Link Local Address **FE80::20A:F3FF:FE5A:ED3A**

IPv6 Gateway

IPv6 DNS Server

PC1

IP Configuration

IP Configuration

DHCP Static

IP Address **192.168.2.2**

Subnet Mask **255.255.255.0**

Default Gateway **192.168.2.1**

DNS Server

IPv6 Configuration

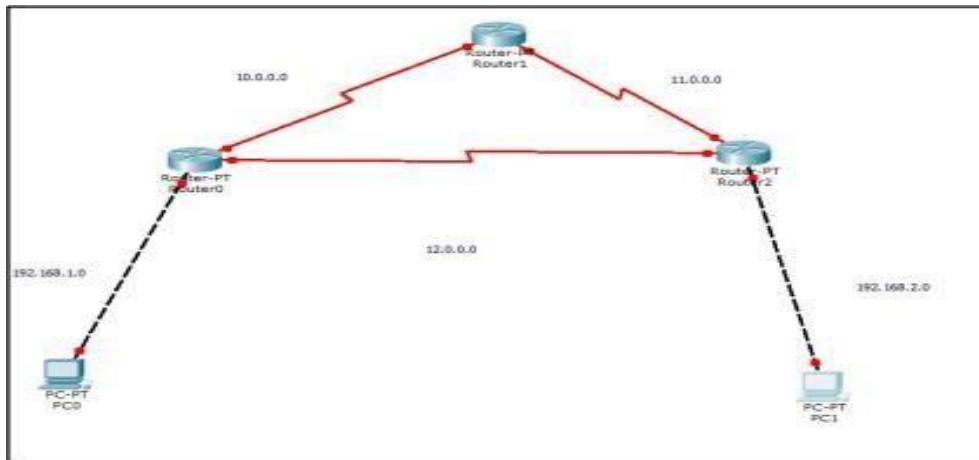
DHCP Auto Config Static

IPv6 Address /

Link Local Address **FE80::260:47FF:FE80:5BCD**

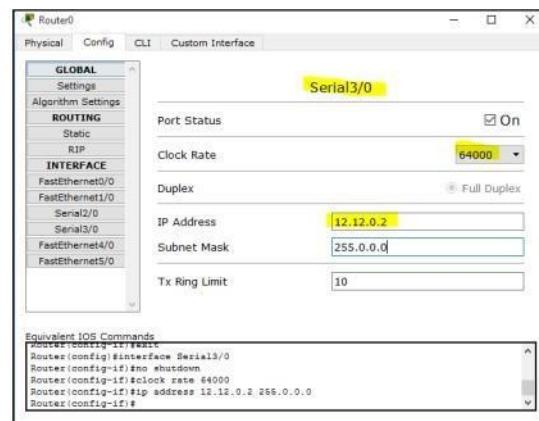
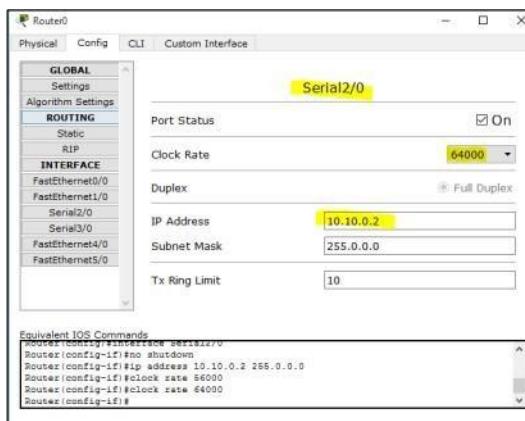
IPv6 Gateway

IPv6 DNS Server



configure the routes.

ROUTER0



```

Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface Serial2/0
Router(config-if)#no shutdown
Router(config-if)#ip address 10.10.0.2 255.0.0.0
Router(config-if)#clock rate 66000
Router(config-if)#clock rate 64000
Router(config-if)#shutdown
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface Serial3/0
Router(config-if)#no shutdown
Router(config-if)#clock rate 64000
Router(config-if)#ip address 12.12.0.2 255.0.0.0
Router(config-if)#
*LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
*LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
*LINK-5-CHANGED: Interface Serial2/0, changed state to up
*LINK-5-CHANGED: Interface Serial3/0, changed state to up
*LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
*LINK-5-CHANGED: Interface Serial3/0, changed state to up

```

ROUTER1

```

----- System Configuration Dialog ----

Continue with configuration dialog? [yes/no]: n

Press RETURN to get started!

Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface Serial2/0
Router(config-if)#no shutdown
Router(config-if)#
*LINK-5-CHANGED: Interface Serial2/0, changed state to up

*LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
ip address 10.10.0.3 255.0.0.0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial3/0
Router(config-if)#no shutdown
Router(config-if)#
*LINK-5-CHANGED: Interface Serial3/0, changed state to up

*LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up

```

ROUTER2

The image shows two windows of a router configuration interface for Router2.

FastEthernet0/0 Configuration:

- Port Status:** On
- Bandwidth:** 100 Mbps
- Duplex:** Half Duplex
- MAC Address:** 0003.E45D.5972
- IP Address:** 192.168.2.1
- Subnet Mask:** 255.255.255.0
- Tx Ring Limit:** 10

Equivalent IOS Commands:

```
*LINK-5-CHANGED: Interface fastethernet0/0, changed state to up
*LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
```

Serial2/0 Configuration:

- Port Status:** On
- Clock Rate:** 2000000
- Duplex:** Full Duplex
- IP Address:** 11.11.0.3
- Subnet Mask:** 255.0.0.0
- Tx Ring Limit:** 10

Equivalent IOS Commands:

```
*LINK-5-CHANGED: Interface serial2/0, changed state to up
*LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
no ip address
Router(config-if)#ip address 11.11.0.3 255.0.0.0
Router(config-if)#
```

The image shows a window of a router configuration interface for Router2.

Serial3/0 Configuration:

- Port Status:** On
- Clock Rate:** 2000000
- Duplex:** Full Duplex
- IP Address:** 12.12.0.3
- Subnet Mask:** 255.0.0.0
- Tx Ring Limit:** 10

Equivalent IOS Commands:

```
*LINK-5-CHANGED: Interface Serial3/0, changed state to up
*LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up
ip address 12.12.0.3 255.0.0.0
Router(config-if)#
```

Press RETURN to get started!

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#no shutdown

Router(config-if)#
*LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

*LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
ip address 192.168.2.1 255.255.255.0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial2/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial2/0
Router(config-if)#no shutdown
Router(config-if)#
*LINK-5-CHANGED: Interface Serial2/0, changed state to up

*LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
no ip address
```

```

Router(config-if)#ip address 11.11.0.3 255.0.0.0
Router(config-if)#
Router(config-if)#exit
Router(config)#+interface Serial2/0
Router(config-if)#
Router(config-if)#exit
Router(config)#+interface Serial2/0
Router(config-if)#
Router(config-if)#exit
Router(config)#+interface Serial3/0
Router(config-if)#
Router(config-if)no shutdown
Router(config-if)#
*LINK-5-CHANGED: Interface Serial3/0, changed state to up

*LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up
ip address 12.12.0.3 255.0.0.0
Router(config-if)#

```

Configure the routers with OSPF

The image shows three separate windows for Cisco routers:

- Router0:** Shows the configuration of OSPF on Serial interfaces. It includes commands like `Router(config-if)#router ospf 1` and `Router(config-router)#network` statements for areas 0 and 1.
- Router1:** Shows the configuration of OSPF on FastEthernet and Serial interfaces. It includes `Router(config-if)#enable` and `Router(config-if)#router ospf 1` followed by network statements.
- Router2:** Shows the configuration of OSPF on Serial and FastEthernet interfaces. It includes `Router(config-if)#exit` and `Router(config)#+interface` commands, followed by OSPF configuration and network statements.

Check is ospf is running

Router0

Physical Config CLI Custom Interface

IOS Command Line Interface

```

Router#
SYS-5-CONFIG_I: Configured from console by console
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#copy running-config startup-config
* Invalid input detected at '^' marker.
Router(config)#end
Router#
SYS-5-CONFIG_I: Configured from console by console
Router#copy running-config startup-config?
Destination filename [startup-config]?
Building configuration...
[OK]
Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
      D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
      N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
      E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
      i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
      * - candidate default, U - per-user static route, o - ODR
      P - periodic downloaded static route
Gateway of last resort is not set
O  10.0.0.0/8 is directly connected, Serial2/0
O  11.0.0.0/8 [110/128] via 10.10.0.3, 00:07:41, Serial1/0
C  12.0.0.0/8 is directly connected, Serial3/0
C  192.168.1.0/24 [110/65] via 12.12.0.3, 00:07:41, Serial3/0
O  192.168.2.0/24 [110/65] via 12.12.0.3, 00:07:41, Serial3/0
Router#

```

Router2

Physical Config CLI Custom Interface

IOS Command Line Interface

```

Router#
SYS-5-CONFIG_I: Configured from console by console
Router#
Router#
Router#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
Router#
Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
      D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
      N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
      E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
      i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
      * - candidate default, U - per-user static route, o - ODR
      P - periodic downloaded static route
Gateway of last resort is not set
O  10.0.0.0/8 [110/128] via 11.11.0.2, 00:11:33, Serial2/0
O  11.0.0.0/8 is directly connected, Serial2/0
C  12.0.0.0/8 is directly connected, Serial3/0
O  192.168.1.0/24 [110/65] via 12.12.0.2, 00:11:33, Serial3/0
C  192.168.2.0/24 is directly connected, FastEthernet0/0
Router#

```

Router1

Physical Config CLI Custom Interface

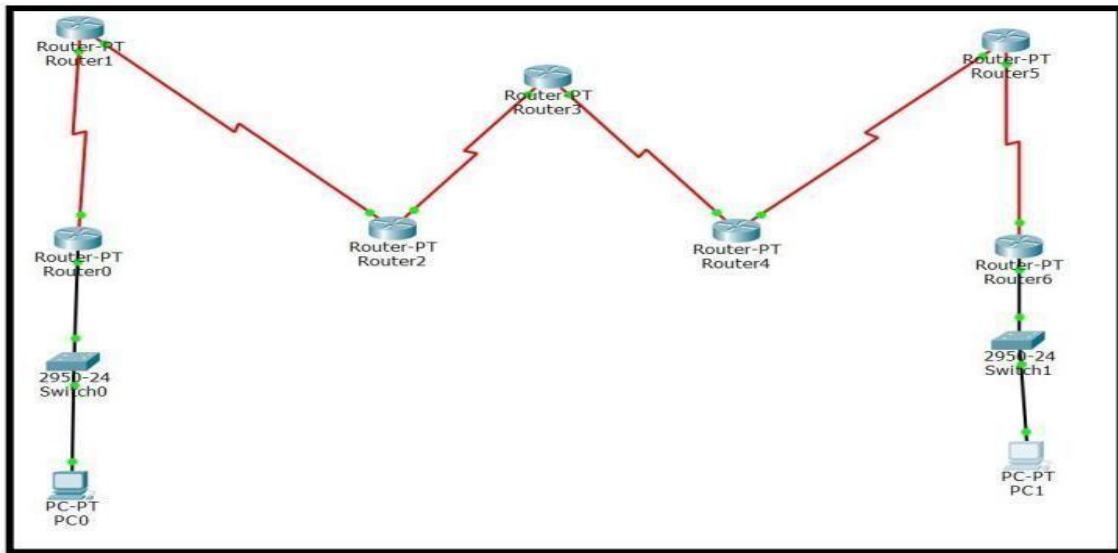
IOS Command Line Interface

```

Router>
Router>
Router>en
Router#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
      D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
      N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
      E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
      i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
      * - candidate default, U - per-user static route, o - ODR
      P - periodic downloaded static route
Gateway of last resort is not set
C  10.0.0.0/8 is directly connected, Serial2/0
C  11.0.0.0/8 is directly connected, Serial3/0
O  12.0.0.0/8 [110/128] via 10.10.0.2, 00:10:36, Serial2/0
O  192.168.1.0/24 [110/65] via 10.10.0.2, 00:17:22, Serial2/0
O  192.168.2.0/24 [110/65] via 11.11.0.3, 00:12:50, Serial3/0
Router#

```

TASK NO 2: Topology



ROUTER 0:

```
Router>enable
Router#configure
Configuring from terminal, memory, or network [terminal]
Enter configuration commands, one per line. End with
CTRL/Z.
Router(config)#interface serial 2/0
Router(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial2/0, changed state to
down
Router(config-if)#
Router(config-if)#ip address 192.168.2.1 255.255.255.0
Router(config-if)#exit
Router(config)#exit
Router#

Router(config)#interface fastethernet 0/0
Router(config-if)#ip address 192.168.4.2 255.255.255.0
Router(config-if)#exit
Router(config)#interface fastethernet 0/0
Router(config-if)#no shutdown

Router>enable
Router#configure
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CTRL/Z.
Router(config)#router ospf 1
Router(config-router)#network 192.168.4.0 0.0.0.255
% Incomplete command.
Router(config-router)#network 192.168.4.0 0.0.0.255 area 1
Router(config-router)#network 192.168.2.0 0.0.0.255 area 1
Router(config-router)#exit
Router#conf t
Router#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
Router#
```

ROUTER 1:

```
Router(config)#interface serial 2/0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to

Router(config-if)#ip address
%LINEPROTO-5-UPDOWN: Line protocol on Interface
Serial2/0, changed state to up

% Incomplete command.
Router(config-if)#ip address 192.168.2.2 255.255.255.0
Router(config-if)#exit


---


Router(config)#interface serial 3/0
Router(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial3/0, changed state to
down
Router(config-if)#
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#exit
Router(config)#!|_
Router(config)#router ospf 1
Router(config-router)#network 192.168.2.0 0.0.0.255 area 1
Router(config-router)#
02:00:53: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.4.2 on
Serial2/0 from LOADING to FULL, Loading Done

Router(config-router)#network 192.168.1.0 0.0.0.255 area 1
Router(config-router)#exit
Router(config)#!|
Router#|_
%SYS-5-CONFIG_I: Configured from console by console

Router#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
```

ROUTER 2

```
Router(config)#interface serial 2/0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to u|_]

Router(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface
Serial2/0, changed state to up

Router(config-if)#ip address 192.168.1.2 255.255.255.0
Router(config-if)#exit
-----|_]
```

```
Router(config)#interface serial 3/0
Router(config-if)#no shutdown
Router(config-if)#ip address 10.1.1.1 255.255.255.252
Router(config-if)#exit
Router(config)#
Router>enable
Router#configure
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router ospf 1
Router(config-router)#network 10.1.1.0 0.0.0.3 area 0
Router(config-router)#
03:22:01: %OSPF-5-ADJCHG: Process 1, Nbr 10.2.2.1 on Serial3/0
from LOADING to FULL, Loading Done

Router(config-router)#network 192.168.1.0 0.0.0.255 area 1
Router(config-router)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#copy running-config startup-config
Destination filename [startup-config]? |
```

ROUTER 3

```
Router>enable
Router#configure
Configuring from terminal, memory, or network [terminal]
Enter configuration commands, one per line. End with
CNTL/Z.
Router(config)#interface serial 2/0
^
% Invalid input detected at '^' marker.

Router(config)#interface serial 2/0
Router(config-if)#no shutdown
Router(config-if)#ip address 10.1.1.2 255.255.255.252
Router(config-if)#exit
Router(config)#interface serial 3/0
Router(config-if)#ip address 10.2.2.1 255.255.255.252
Router(config-if)#exit
Router(config)#interface serial 3/0
Router(config-if)#no shutdown
-
Router(config)#router ospf 1
Router(config-router)#network 10.2.2.0 0.0.0.3 area 0
Router(config-router)#
03:19:49: %OSPF-5-ADJCHG: Process 1, Nbr 172.16.1.33 on
Serial3/0 from LOADING to FULL, Loading Done

Router(config-router)#network 10.1.1.0 0.0.0.3 area 0
Router(config-router)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
Router#
```

ROUTER 4

```
Router(config)#interface serial 2/0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

Router(config-if)#ip address
%LINEPROTO-5-UPDOWN: Line protocol on Interface
Serial2/0, changed state to up

% Incomplete command.
Router(config-if)#ip address 10.2.2.2 255.255.255.252
Router(config-if)#exit
Router(config)#

Router(config)#interface serial 3/0
Router(config-if)#no shutdown
Router(config-if)#ip address 172.16.1.33 255.255.255.224
Router(config-if)#exit
Router(config)#

Router(config)#router ospf 1
Router(config-router)#network 172.16.1.32 0.0.0.31 area 2
Router(config-router)#netw
03:16:32: %OSPF-5-ADJCHG: Process 1, Nbr 172.16.1.65 on
Serial3/0 from LOADING to FULL, Loading Done

% Incomplete command.
Router(config-router)#network 10.2.2.0 0.0.0.3 area 0
Router(config-router)#exit
Router(config)#
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
```

ROUTER 5

```
Router(config)#int serial 2/0
Router(config-if)#ip address 172.16.1.34 255.255.255.224
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

Router(config-if)#exit
```

```

Router(config)#int serial 3/0
Router(config-if)#ip address 172.16.1.65 255.255.255.224
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#

Router>enable
Router#configure
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router ospf 1
Router(config-router)#network 172.16.1.64 0.0.0.31 area 2
Router(config-router)#
03:13:18: %OSPF-5-ADJCHG: Process 1, Nbr 172.16.1.97 on Serial3,
from LOADING to FULL, Loading Done

Router(config-router)#network 172.16.1.32 0.0.0.31 area 2
Router(config-router)#exit
Router(config)#
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]

```

ROUTER 6

```

Router(config)#int serial 2/0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

Router(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed
state to up

Router(config-if)#ip address 172.16.1.66 255.255.255.224
Router(config-if)#exit
Router(config)#interface fastethernet 0/0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0,
changed state to up

Router(config-if)#ip address 172.16.1.97 255.255.255.224
Router(config-if)#exit
Router(config)#

```

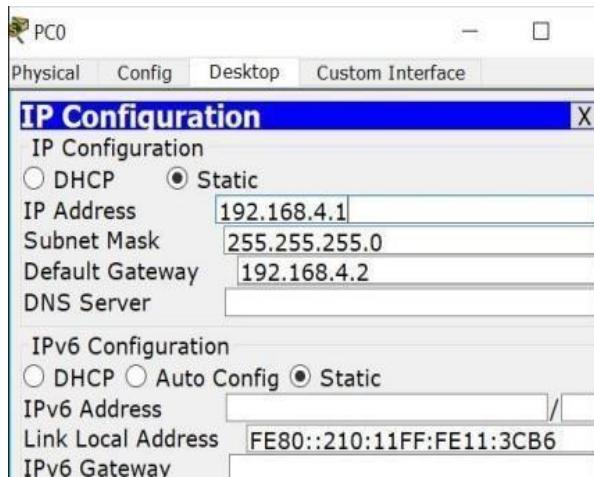
```

Router>enable
Router#configure
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router ospf 1
Router(config-router)#network 172.16.1.96 0.0.0.31 area 2
Router(config-router)#network 172.16.1.64 0.0.0.31 area 2
Router(config-router)#exit
Router(config)#
Router#
%SYS-5-CONFIG_I: Configured from console by console

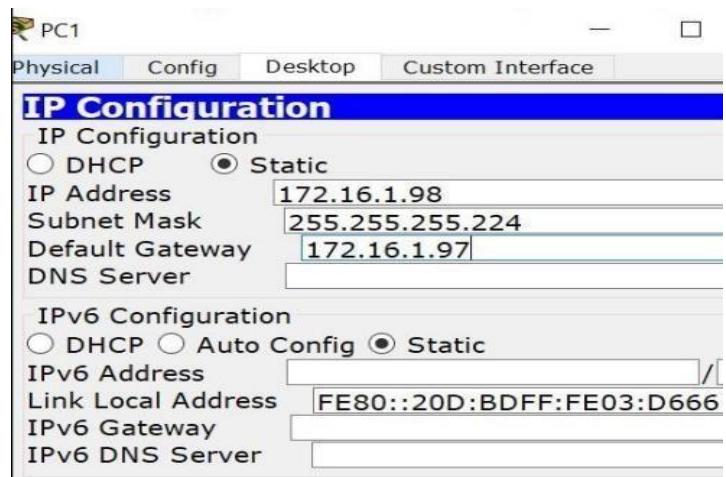
Router#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]

```

Configuring PC 0:



Configuring PC 1



Ping End Devices

```
PC>ping 192.168.4.1

Pinging 192.168.4.1 with 32 bytes of data:

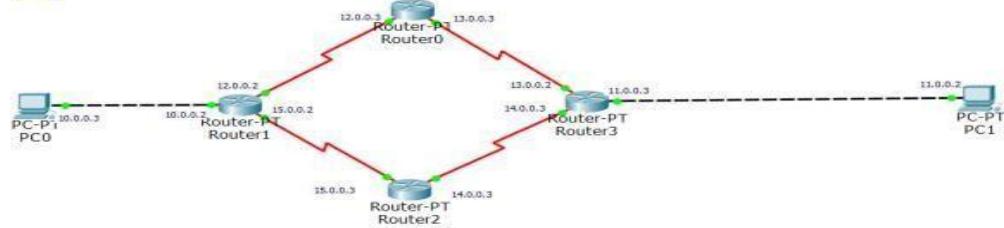
Reply from 192.168.4.1: bytes=32 time=8ms TTL=121
Reply from 192.168.4.1: bytes=32 time=6ms TTL=121
Reply from 192.168.4.1: bytes=32 time=6ms TTL=121
Reply from 192.168.4.1: bytes=32 time=6ms TTL=121

Ping statistics for 192.168.4.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 6ms, Maximum = 8ms, Average = 6ms
```

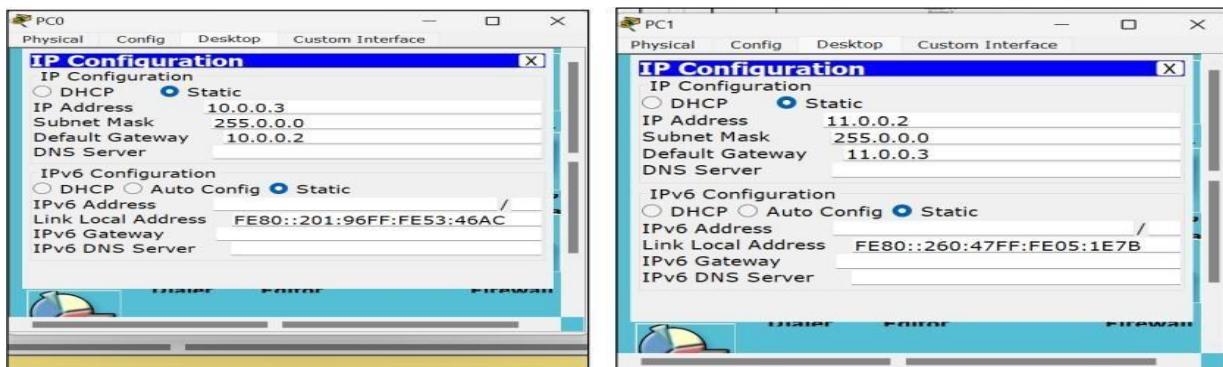
LAB#11

EIGRP

Create network topology



Assign ip to all pc's and routers.



Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
ip address 10.0.0.2 255.0.0.0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet1/0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet1/0, changed state to up
ip address 15.0.0.2 255.0.0.0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial3/0
Router(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial3/0, changed state to down
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial12/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial2/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial2/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial12/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial12/0
Router(config-if)#no shutdown

Router#enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface Serial3/0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface Serial3/0, changed state to up
ip address 13.0.0.3 255.0.0.0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial2/0
Router(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up
no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up
ip address 12.0.0.3 255.0.0.0
Router(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up

Router(config-if)#end
Router#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router2

Physical Config CLI

IOS Command Line Interface

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface Serial2/0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up
ip address 14.0.0.3 255.0.0.0
Router(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up

Router(config-if)#exit
Router(config)#interface Serial3/0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface Serial3/0, changed state to up
ip address 15.0.0.3 255.0.0.0
Router(config-if)#
Router(config-if)#end
Router#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
Router#
%SYS-5-CONFIG_I: Configured from console by console

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up
```

Configure eigrp Router1

```
Router>en
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router eigrp 10
Router(config-router)#network 10.0.0.0
Router(config-router)#network 12.0.0.0
Router(config-router)#network 15.0.0.0
Router(config-router)#exit
Router(config)#
%DUAL-5-NBRCHANGE: IP-EIGRP 10: Neighbor 12.0.0.3 (Serial2/0) is up: new adjacency
```

Router2

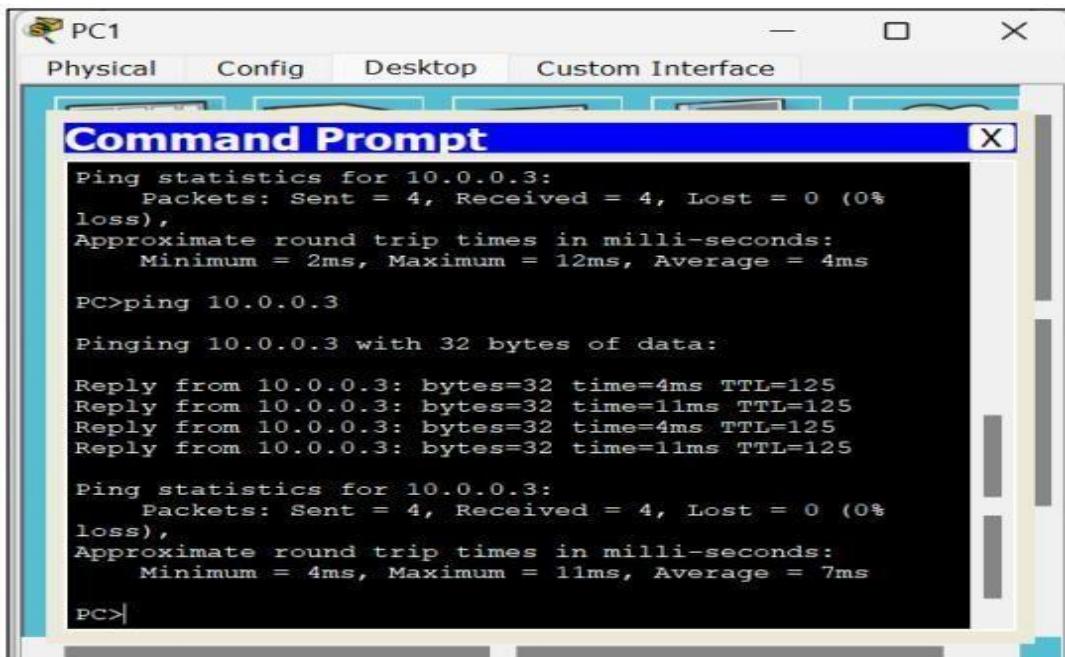
Routrer3

```
~~~~~  
%SYS-5-CONFIG_I: Configured from console by console  
  
Router#config t  
Enter configuration commands, one per line. End with CNTL/Z.  
Router(config)#router eigrp 10  
Router(config-router)#network 13.0.0.0  
Router(config-router)#  
Router(config-router)#network 14.0.0.0  
Router(config-router)#network 11.0.0.0  
Router(config-router)#exit  
Router(config)#  
Router(config)#%IP-4-DUPADDR: Duplicate address 11.0.0.3 on FastEthernet0/0, sourced by 0060.4705.1E7B
```

Router 0

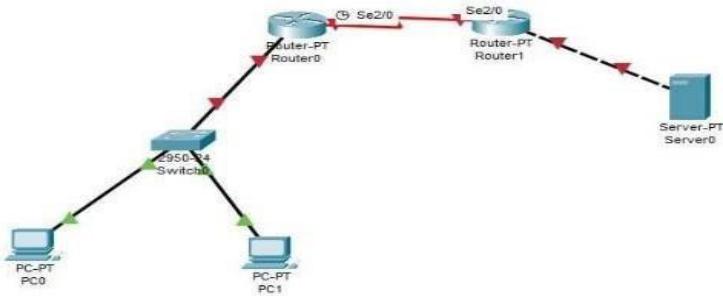
```
Router>en  
Router#config t  
Enter configuration commands, one per line. End with CNTL/Z.  
Router(config)#router eigrp 10  
Router(config-router)#netwok 12.0.0.0  
^  
% Invalid input detected at '^' marker.  
  
Router(config-router)#network 12.0.0.0  
Router(config-router)#  
%DUAL-5-NBRCHANGE: IP-EIGRP 10: Neighbor 12.0.0.2 (Serial2/0) is up: new adjacency  
  
Router(config-router)#netwok 13.0.0.0  
^  
% Invalid input detected at '^' marker.  
  
Router(config-router)#network 13.0.0.0  
Router(config-router)#network 12.0.0.0  
Router(config-router)#network 13.0.0.0  
Router(config-router)#exit  
Router(config)#exit  
Router#  
%SYS-5-CONFIG_I: Configured from console by console  
  
Router#  
%DUAL-5-NBRCHANGE: IP-EIGRP 10: Neighbor 13.0.0.2 (Serial3/0) is up: new adjacency
```

Ping



LAB#12

NAT (Network Address Translation)



ROUTER 0

```
Router0
Physical Config CLI Attributes
IOS Command Line Interface
Would you like to enter the initial configuration dialog? [yes/no]: n
Press RETURN to get started!

Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 0.0.0.0 0.0.0.0 se
* Incomplete command.
Router(config)#ip route 0.0.0.0 0.0.0.0 serial 2/0
Router(config)#exit
Router#
*SYS-5-CONFIG_I: Configured from console by console
Router#exit
```

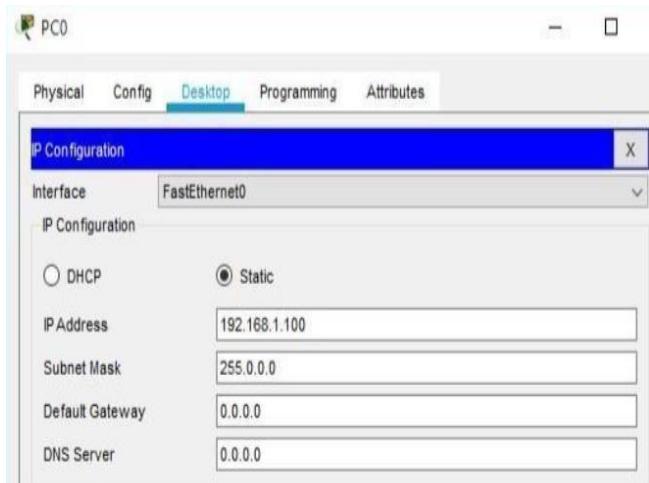
ROUTER 1

```
Router1
Physical Config CLI Attributes
IOS Command Line Interface
Processor board ID PT0123 (0123)
PT2005 processor: part number 0, mask 01
Bridging software.
X.25 software, Version 3.0.0.
4 FastEthernet/IEEE 802.3 interface(s)
2 Low-speed serial(sync/async) network interface(s)
32K bytes of non-volatile configuration memory.
63488K bytes of ATA CompactFlash (Read/Write)

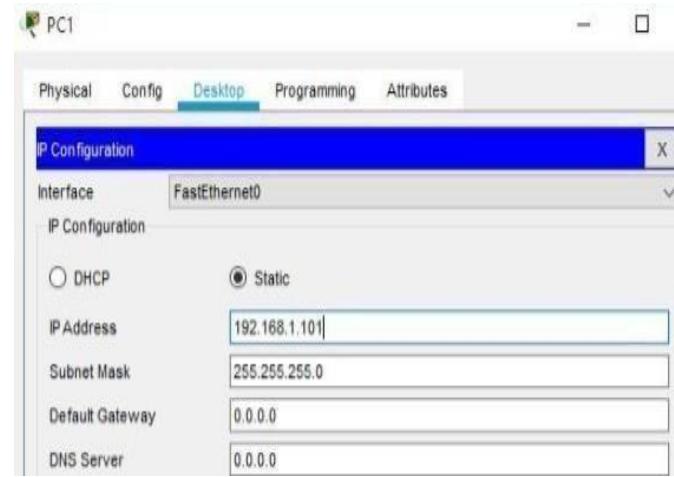
--- System Configuration Dialog ---
Would you like to enter the initial configuration dialog? [yes/no]: n
Press RETURN to get started!

Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 0.0.0.0 0.0.0.0 serial 2/0
Router(config)#exit
Router#
*SYS-5-CONFIG_I: Configured from console by console
Router#
```

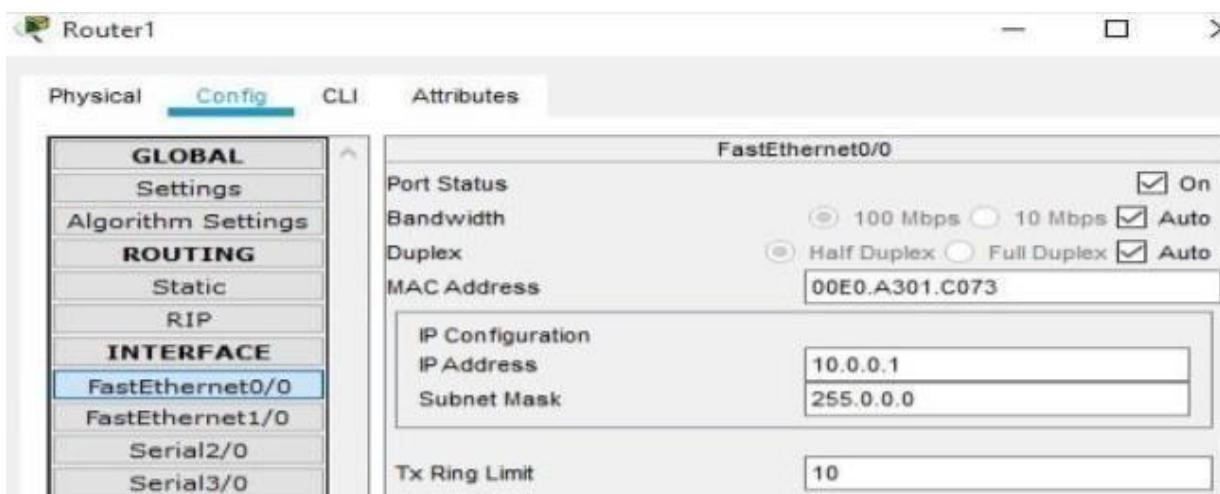
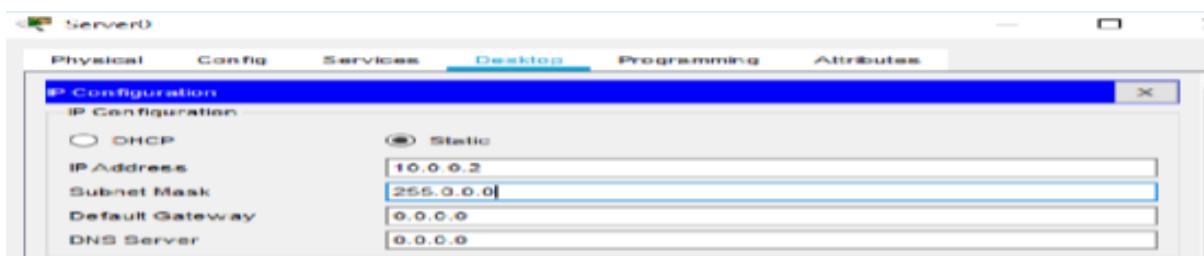
PC 0

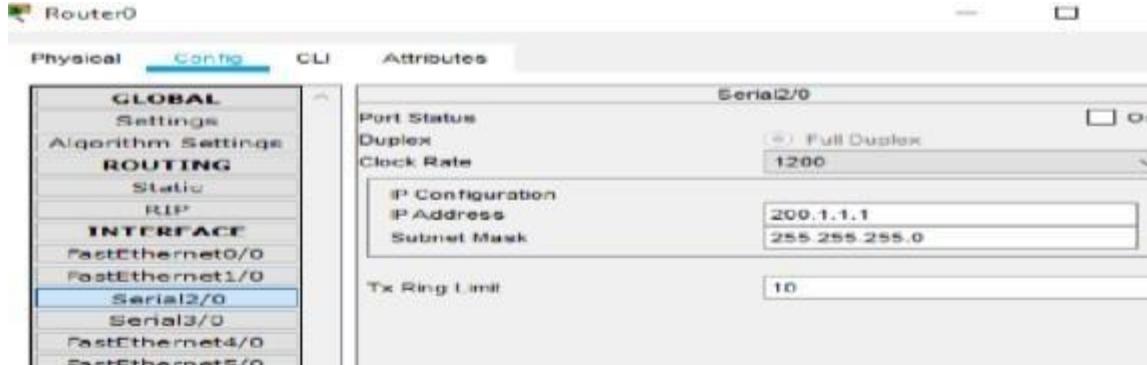
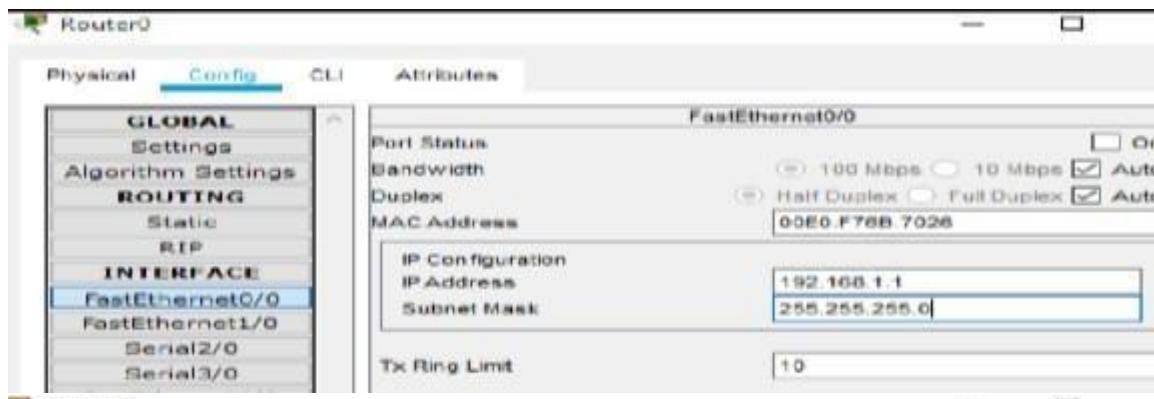


PC 1



SERVER





ROUTER 1



Ping

```
C:\>ping 192.168.1.100

Pinging 192.168.1.100 with 32 bytes of data:

Request timed out.
Reply from 192.168.1.100: bytes=32 time=12ms TTL=126
Reply from 192.168.1.100: bytes=32 time=3ms TTL=126
Reply from 192.168.1.100: bytes=32 time=3ms TTL=126

Ping statistics for 192.168.1.100:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 3ms, Maximum = 12ms, Average = 6ms

C:\>
```

PC0

Physical Config Desktop Programming Attributes

Command Prompt X

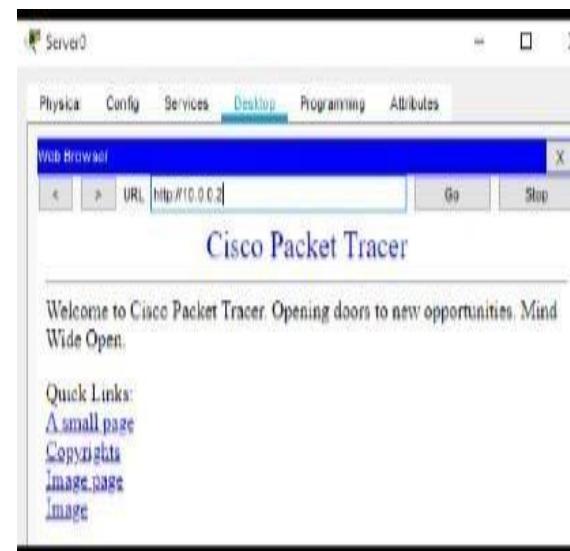
```
Packet Tracer DC Command Line 1.0
C:\>PING 10.0.0.2

Pinging 10.0.0.2 with 32 bytes of data:

Reply from 10.0.0.2: bytes=32 time=1ms TTL=126
Reply from 10.0.0.2: bytes=32 time=1ms TTL=126
Reply from 10.0.0.2: bytes=32 time=2ms TTL=126
Reply from 10.0.0.2: bytes=32 time=3ms TTL=126

Ping statistics for 10.0.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 3ms, Average = 1ms

C:\>
```



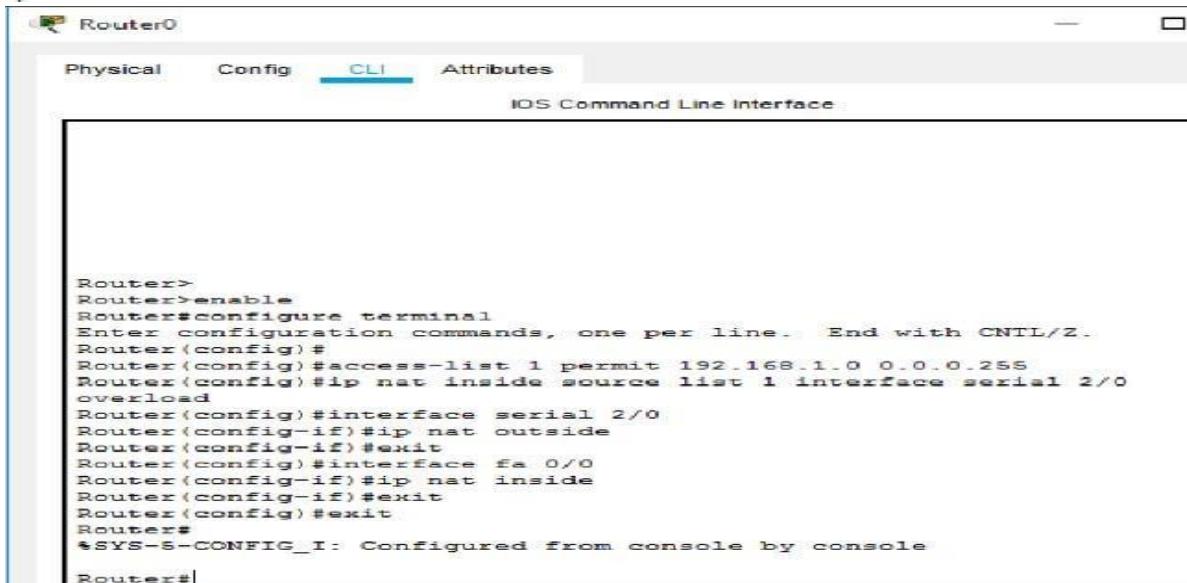
```
Router>
Router>ENABLE
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip nat inside source static 10.0.0.2 200.1.1.2
Router(config)#interface serial 2/0
Router(config-if)#ip nat outside
Router(config-if)#exit
Router(config)#interface fastethernet 0/0
Router(config-if)#ip nat inside
Router(config-if)#exit
Router(config)#exit
Router#
*SYS-5-CONFIG_I: Configured from console by console

Router#show running-config
Building configuration...

Current configuration : 818 bytes
!
version 12.2
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname Router
!
!
!
!
!
!
!
!
ip cef
no ipv6 cef
!
```

```

interface FastEthernet0/0
 ip address 10.0.0.1 255.0.0.0
 ip nat inside
 duplex auto
 speed auto
!
interface FastEthernet1/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface Serial2/0
 ip address 200.1.1.2 255.255.255.0
 ip nat outside
!
interface Serial3/0
 no ip address
 shutdown
!
interface FastEthernet4/0
 no ip address
 shutdown
!
interface FastEthernet5/0
 no ip address
 shutdown
!
ip nat inside source static 10.0.0.2 200.1.1.2
ip classless
ip route 0.0.0.0 0.0.0.0 Serial2/0
!
ip flow-export version 9
!
!
!
```



CHECKING



LAB#13

WORKING ON PHYSICAL ROUTER AND SWITCH

DONE BY GROUP A

Switch#show vlan brief			
VLAN	Name	Status	Ports
1	default	active	Fa0/1, Fa0/2, Fa0/3, Fa0/4 Fa0/5, Fa0/6, Fa0/7, Fa0/8 Fa0/9, Fa0/10, Fa0/11, Fa0/12 Fa0/13, Fa0/14, Fa0/15, Fa0/16 Fa0/17, Fa0/18, Fa0/19, Fa0/20 Fa0/21, Fa0/22, Fa0/23, Fa0/24 Gi0/1, Gi0/2
8	aqsa_tariq	active	
9	ayesha_afzal	active	
10	rida	active	
11	raheela	active	
12	mahnoor	active	
13	eyman	active	
14	zikra	active	
15	laiba	active	
16	fizza	active	
17	laraib	active	
18	maham	active	
19	fatima	active	
20	laraibbbbb	active	
21	azka	active	
22	jaleesa	active	
25	rimsha_ashraf	active	
30	tehreem_fatima	active	
47	iqra_k	active	
52	maliha	active	
57	nukhba	active	
60	rimsha	active	
63	saniamajid	active	
65	tehreemaqdas	active	
1002	fdi-default	act/unsup	



COM1 - PutTY

```
Switch#
Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#interface fa0/1
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 10
Switch(config-if)#end
Switch#
```

```

Switch(config)#interface fa0/3
Switch(config-if)#switchport access vlan 13
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 13
Switch(config-if)#exit
Switch(config)#interface fa0/4
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 14
Switch(config-if)#exit
Switch(config)#interface fa0/5
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 15
Switch(config-if)#exit
Switch(config)#interface fa0/6
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 16
Switch(config-if)#exit
Switch(config)#interface fa0/7
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 17
Switch(config-if)#exit
Switch(config)#interface fa0/8
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 18
Switch(config-if)#exit
Switch(config)#interface fa0/9
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 19
Switch(config-if)#exit
Switch(config)#interface fa0/10
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 20
Switch(config-if)#exit
Switch(config)#end

```

Switch#show vlan brief

VLAN	Name	Status	Ports
1	default	active	Fa0/11, Fa0/12, Fa0/13, Fa0/14 Fa0/15, Fa0/16, Fa0/17, Fa0/18 Fa0/19, Fa0/20, Fa0/21, Fa0/22 Fa0/23, Fa0/24, Gi0/1, Gi0/2
8	aqsa_tariq	active	
9	ayesha_afzal	active	
10	rida	active	Fa0/1
11	raheela	active	Fa0/2
12	mahnoor	active	
13	eyman	active	Fa0/3
14	zikra	active	Fa0/4
15	laiba	active	Fa0/5
16	fizza	active	Fa0/6
17	laraib	active	Fa0/7
18	maham	active	Fa0/8
19	fatima	active	Fa0/9
20	laraibbbbb	active	Fa0/10
21	azka	active	
22	jaleesa	active	
25	rimsha_ashraf	active	

DONE BY GROUP B

```
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#vtp?
vtp

Switch(config)#vtp
% Incomplete command.

Switch(config)#vtp ?
  domain      Set the name of the VTP administrative domain.
  file        Configure IFS filesystem file where VTP configuration is stored.
  interface   Configure interface as the preferred source for the VTP IP address.
  mode        Configure VTP device mode
  password   Set the password for the VTP administrative domain
  pruning    Set the administrative domain to permit pruning
  version    Set the administrative domain to VTP version

Switch(config)#vtp mode server
Device mode already VTP SERVER.
```

```
WORD  The ascii name for the VTP administrative domain.

Switch(config)#vtp domain groupvtp
Changing VTP domain name from CCNA to groupvtp
Switch(config)#switchport trunk allowed
^
% Invalid input detected at '^' marker.

Switch(config)#switchport trunk allowed vlan all
^
% Invalid input detected at '^' marker.

Switch(config)#switchport trunk allowed vlan ?
% Unrecognized command
Switch(config)#interface fastethernet 0/1
Switch(config-if)#switchport trunk allowed vlan all
Switch(config-if)#exit
Switch(config)#exit
^
% Invalid input detected at '^' marker.

Switch(config)#exit
Switch#show
00:21:23: %SYS-5-CONFIG_I: Configured from console by co
Switch#show vtp status
VTP Version           : 2
Configuration Revision : 0
Maximum VLANs supported locally : 255
Number of existing VLANs       : 28
VTP Operating Mode        : Server
VTP Domain Name          : groupvtp
VTP Pruning Mode         : Disabled
VTP V2 Mode               : Disabled
VTP Traps Generation     : Disabled
MDS digest              : 0x8A 0x09 0xE8 0xF7 0xBD 0x2D 0x44 0x91
Configuration last modified by 0.0.0.0 at 3-1-93 00:16:06
Local updater ID is 0.0.0.0 (no valid interface found)
Switch#
Switch#
Switch#configure t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#vtp mode transparent
Setting device to VTP TRANSPARENT mode.
```

```

Switch(config)#exit
Switch#
00:23:19: %SYS-5-CONFIG_I: Configured from console by console
Switch#configure t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#interface fastethernet 0/1
Switch(config-if)#switchport mode trunk
Switch(config-if)#interface fastethernet 0/2
^
% Invalid input detected at '^' marker.

Switch(config)#interface fastethernet 0/2
Switch(config-if)#switchport mode trunk
Switch(config-if)#exit
Switch(config)#exit
Switch#
00:24:51: %SYS-5-CONFIG_I: Configured from console by console
Switch#
Switch#show vtp status
VTP Version : 2
Configuration Revision : 0
Maximum VLANs supported locally : 255
Number of existing VLANs : 28
VTP Operating Mode : Transparent
VTP Domain Name : groupvtp
VTP Pruning Mode : Disabled
VTP V2 Mode : Disabled
VTP Traps Generation : Disabled
MD5 digest : 0x8A 0x09 0xE8 0xF7 0xBD 0x2D 0x44 0x91
Configuration last modified by 0.0.0.0 at 3-1-93 00:16:06
Switch#config
Switch#configure t
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#vtp mode client
Setting device to VTP CLIENT mode.
Switch(config)#interface fastethernet 0/1
Switch(config-if)#switchport mode trunk
Switch(config-if)#switchport trunk allowed vlan all
Switch(config-if)#end
Switch#
00:26:44: %SYS-5-CONFIG_I: Configured from console by console
Switch#show vtp status

```

```

Switch#
00:26:44: %SYS-5-CONFIG_I: Configured from console by console
Switch#show vtp status
VTP Version : 2
Configuration Revision : 0
Maximum VLANs supported locally : 255
Number of existing VLANs : 28
VTP Operating Mode : Client
VTP Domain Name : groupvtp
VTP Pruning Mode : Disabled
VTP V2 Mode : Disabled
VTP Traps Generation : Disabled
MD5 digest : 0x8A 0x09 0xE8 0xF7 0xBD 0x2D 0x44 0x91
Configuration last modified by 0.0.0.0 at 3-1-93 00:16:06
Switch#

```

DONE BY GROUP C • Port-security restrict

```
Switch(config)#interface fa 0/1
Switch(config-if)#switchport mode access
Switch(config-if)#switchport port-security
Switch(config-if)#switchport port-security maximum 1
Switch(config-if)#switchport port-security mac-address sticky
Switch(config-if)#switchport port-security violation restrict
Switch(config-if)#exit
Switch(config)#exit
Switch#
00:04:10: %SYS-5-CONFIG_I: Configured from console by console

Switch#show port-security interface fa 0/1
Port Security          : Enabled
Port Status             : Secure-down
Violation Mode         : Restrict
Aging Time              : 0 mins
Aging Type              : Absolute
SecureStatic Address Aging : Disabled
Maximum MAC Addresses   : 1
Total MAC Addresses     : 0
Configured MAC Addresses : 0
Sticky MAC Addresses    : 0
Last Source Address:Vlan : 0000.0000.0000:0
Security Violation Count : 0
```

Port-security shutdown

```
Switch(config)#int fa 0/2
Switch(config-if)#switchport mode access
Switch(config-if)#switchport port-security
Switch(config-if)#switchport port-security maximum 1
Switch(config-if)#switchport port-security mac-address sticky
Switch(config-if)#switchport port-security violation shutdown
Switch(config-if)#exit
Switch(config)#exit
Switch#show port-security interface fa 0/1
00:06:36: %SYS-5-CONFIG_I:configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#exit
```

```
Switch#show port-security interface fa 0/2
Port Security          : Enabled
Port Status             : Secure-down
Violation Mode         : Shutdown
Aging Time              : 0 mins
Aging Type              : Absolute
SecureStatic Address Aging : Disabled
Maximum MAC Addresses   : 1
Total MAC Addresses     : 0
Configured MAC Addresses : 0
Sticky MAC Addresses    : 0
Last Source Address:Vlan : 0000.0000.0000:0
Security Violation Count : 0

Switch#
```

```
Switch#show port-security
Secure Port  MaxSecureAddr CurrentAddr  SecurityViolation  Security Action
                (Count)      (Count)            (Count)
-----
Fa0/1           1             0                 0           Restrict
Fa0/2           1             0                 0           Shutdown
-----
Total Addresses in System (excluding one mac per port) : 0
Max Addresses limit in System (excluding one mac per port) : 8320
Switch#
```